

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Framingham, Mass. and additional mailing offices ©1983 by CW Communications/Inc.

\$1.50 a copy; \$44/year

November 14, 1983

Vol. XVII, No. 46

Product Spotlight

The Portables: Traveling Quickly

By Jim Bartimo
CW Staff

It is a testament to the exponential speed with which computer technology is moving that it took 30 years to shrink a room-size computer to desktop size, but less than five years to shrink a desktop computer to the size of a briefcase.

The move to miniaturization is continuing with portable computers, which today are offered in a variety of sizes — small, medium and large. The large ones — "transportables" — are 20- to 30-pound, full-function micros. The medium and small ones — "portables" — usually weigh 12 pounds or less and have fewer capabilities than a desktop. (There are also extra-small, hand-held systems with one-line displays, but their applications are limited.)

Just how seriously should the transportable market be taken? At the end of this year, some 410,000 transportables will have been sold, according to Future Computing, Inc. Moreover, the Richardson, Texas, market research firm estimates that this market will grow from \$1.23 billion in 1984 to \$2.76 billion in 1987.

Because the suitcase-size transportables weigh in at a back-breaking 20 to 30 pounds, many users are not, in fact, buying them with long-distance travel in mind. According to John Hemphill, senior technology consultant for Future Computing and an expert on portables, much of the travel that these computers do is within the office. For example, a company that does not need a machine on every desk can "divide" one among four managers.

Ellen Levin, product manager for International Data Corp. in Framingham, Mass., agreed that transportables are "too heavy to take back and forth to the home and office." But, she noted, a service organization such as a Big Eight accounting firm could hand them out for computing at the client's office for weeks at a time.

While transportables' weight may be too much, their size is just right. "The small footprint is a big factor," explained Kenneth

(Continued on Page 10)

Shown from top to bottom are a suitcase-size transportable (Televideo Systems, Inc.'s Teletote I); a briefcase-size portable (Grid Systems Corp.'s Compass); and a notebook-size portable (NEC Home Electronics USA's PC-8201).

One-Vendor Users Groups Denied Tax-Exempt Status

By Tom Henkel
CW Staff

WASHINGTON, D.C. — The Internal Revenue Service has pulled the rug out from under computer users groups with a ruling that denies tax-exempt status to user organizations dedicated to one vendor's products.

The Oct. 31 ruling applies to organizations seeking tax exemption as a "business league" or a group of people with a common business interest. In most cases, users groups are primarily comprised of users of a specific vendor's hardware. But even if the organization allows nonusers to join its ranks, the users group cannot qualify for the exempt status unless the forum is open to competing vendors, an IRS spokesman said.

The IRS made its decision, a tightening of a similar 1974 ruling, on the reasoning that a vendor's product line is only a segment of the total computer marketplace. A group of users devoted to solving problems and improving that product line, therefore, provides a service for the vendor and puts other vendors at a competitive disadvantage, the IRS spokesman explained.

The ruling caught administrators of most users groups by surprise. Several expressed concern that the ruling could cause financial

problems for their organizations, but most were confused over exactly how the IRS plans to enforce the ruling. Several users group spokesmen said they wanted to see the actual IRS ruling before commenting on its impact.

The issue raised by the IRS centers on whether users groups can exclude makers of different or competing products from their meetings. The national Prime (Computer, Inc.) User Group, for example, does not allow

vendors marketing Prime-compatible hardware and software to display products or make presentations at its meetings, according to the organization's president, Bill Lenharth. IBM users groups, such as Guide and Common, have similar policies.

But other users groups, such as the Eastern Region Prime User's Group (a regional subsidiary of PUG), open their meetings to vendors of competing products. According to PUG-East Presi-

(Continued on Page 8)

Communications Processor Announced by Tandem

By Jeffry Beeler

CW West Coast Bureau

CUPERTINO, Calif. —

Tandem Computers, Inc. today expanded the communications capabilities of its product line with an enhanced front-end processor that reportedly outperforms its Tandem predecessors by 20% to 40% and gives users increased flexibility in configuring their networks.

The Model 6100 integrates into a single package all of the communications features found in the firm's previous systems, a Tandem spokesman said. However, the early models — the 6303, 6202 and 6204 — will continue to be sold and supported.

A beta test site for Tandem's first 32-bit processor, the newly introduced TXP, confirmed the vendor's performance claims. Story on Page 9.

Like the rest of Tandem's fault-tolerant Non-Stop product line, the 6100 is aimed primarily at on-line transaction processing environments requiring large numbers of terminals for applications such as automated banking, point-of-sale and shop-floor control.

The Model 6100 front-end controller is said to accommodate simultaneously up to

(Continued on Page 8)

Inside

First users of Viewtron, America's first commercial videotex service, are happy with what they see. But the technology's true screen test lies in the future. Page 2.

Apple Computer, Inc. will introduce "major new products" early next year, its president said last week as he warned Wall Street analysts that earnings will remain down through next spring. Page 4.

The research relationship between IBM and Josephson junction technology has cooled, raising to three the number of major firms that have put supercooling on the back burner. Page 5.


IMS or IDMS? When the John Hancock Mutual Life Insurance Co. had to choose between those data base management systems, it used a performance man-

agement utility to build performance models of the two. Page 13.

Mobil Oil Corp. has given a little gas to the movement toward a national electronic payment system. It has become the first to announce plans for a network that would allow consumers around the nation to use bank debit cards for retail purchases. Page 103.

Yet another IBM-compatible communications gateway has been announced. A back-end processor from Plexus Computers, Inc. lets users of IBM microcomputers access data in Plexus supermini-computers. Page 117.

An export administration bill has been approved by the House of Representatives. Page 151.

**COMPUTERWORLD**
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
TM reg. U.S. Pat. Off.

Editor John C. Whitmarsh
Managing Editor Rita Shoor
News Editor Cheryl M. Gelb
Technical Editor Timothy J. Scannell
Senior Editors:
Software Paul Gillin
Communications Phil Hirsch
Jim Bartimo
Systems Tom Henkel
Office Automation Jim Bartimo
Industry Bill Laberis
Features George Harraar
International Editor Susan Blakeney
Staff Writers: Katherine Hafner
Patricia Keefe
Peter Bartolik
Lynn Haber
John Gallant

Correspondents:
New York David Myers
Washington, D.C. Jake Kirchner
West Coast Robert Batt
Jeffrey Beeler
Features Coordinator: Barbara Van Scoyoc
Chief Copy Editor: Donovan White
Assistant Chief Copy Editor:
Editor: Kathie Gow
Copy Editors: Becky Batcha
Dave Bouffard
Bruce Crane
Betsy Morse
Deborah Scaduto
Thomas Schmidt
Charlotte Ziems

Assistant to the Editor: June Fetting
Editorial Assistants: Joyce Furia
Mary DeCristoforo

Contributors:
Education J. Daniel Couger
Human Connection Jack Stone
Lecht on Science Charles P. Lecht

SPECIAL PUBLICATIONS
Computerworld Extra!
Editor Bruce Hoard
Copy Editor Patti Hartigan
Computerworld On Communications
Editor Bruce Hoard
Copy Editor Patti Hartigan
Computerworld OA
Editor Ann Dooley
Staff Writer Glenn Rifkin
Copy Editor Nancy Fleming
Computerworld Buyer's Guides
Editor Marcia Blumenthal
Copy Editor Rick LePage

Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES & SALES OFFICES:

New York: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Phone: (212) 570-2135.

West Coast: 1060 Marsh Rd., Menlo Park, Calif. 94025. Phone: (415) 328-8064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Terry Cartwright, EEC Publications, 196-200 Balls Pond Rd., London N1 4AQ. Phone: 01-359-3525. Telex: (851) 894085 (Computer Management, Computer Business Europe only).

France: Axel Leblais, Le Monde Informatique, 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, Paris. Phone: 758.14.14. Telex: 613234 F.

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882. Telex: 252-4217 (Computerworld Japan only).

Esteban H. Yamada, Tokyo Representative Group, Yamaguchi Bldg., 2-12-9 Kanda Jimbo-cho, Chiyoda-ku, Tokyo 101, Phone: (03) 230-4117/8, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133. Telex: AA74752 COMWOR.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-4218, (905) 514-6309. Telex: 1771300 ACHAME, 1777809 ACHAME.

Spain: Neil Kelley, Computerworld/Espana, Gravina, 13, Madrid 4. Phone: 231-23-85; 231-23-86; 231-23-88. Telex: 47894(CW E).

Denmark: Preben Engell, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11. Telex: 27566 cwan.

Sweden: Bengt Marnfeldt, Computerworld/Sweden, Nova Media AB, Vartavagen 55, 11538 Stockholm. Telex: 8105099 NOVACV.

The Netherlands: Johannes A. Witvoet, Mgr. Dir., CW Communications B.V., c/o IDC Benelux, Prins Hendriklaan 11, 1075 Ax Amsterdam. Phone: 020-791-692. Telex: (844) 15741.

Italy: Daniele Comboni, Gruppo Editoriale Jackson, s.r.l., Via Rosellini 12, 20124 Milano.

Argentina: Ruben Argento, Gen. Mgr., Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires Phone: 34-5583/5584.

Second-class postage paid at Framingham, Mass., and additional mailing offices. Computerworld (ISSN-0010-4841) is published weekly, except February (5 issues), April (5 issues), May (6 issues), June (5 issues), August (7 issues), September (5 issues), October (7 issues), November (5 issues), December (5 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/ Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.



Copyright 1983 by CW Communications/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microform through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use, or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$5.00 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, MA 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. ‡

Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc., Box 880, 375 Cochituate Rd., Framingham, MA 01701. ISSN 0010-4841/82 \$3.00 + \$5.00 \$1.50 a copy. U.S. — \$44 a year, Canada, Central & So. America — \$110 a year, Europe — \$165 a year, all other countries — \$245 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Users Generally Pleased

First U.S. Videotex Service Up

By Phil Hirsch
CW Washington Bureau

MIAMI — First users of Viewtron, the nation's first commercial videotex service, which went into operation here Oct. 30, are generally pleased. But whether the videotex service will be a long-term success depends on future subscribers and their acceptance of the technology, according to an executive of the firm that implemented the system.

"It has met our expectations," reported Norman Morrison, executive vice-president of Viewdata Corp. of America. And if subscriptions to Viewtron continue at the present rate, "we'll be in good shape," he said.

The Viewtron venture is the result of seven years of market research and a \$20 million investment. Subscribers access data base information using a \$600 Sceptre terminal supplied by Western Electric.

AT&T was deeply involved with Viewdata in the preliminary planning of the system. However, Viewdata — a wholly owned subsidiary of Knight-Ridder Newspapers, Inc., publishers of the *Miami Herald* and a number of other papers — is the system operator.

If Viewtron succeeds in Miami,

similar services will be launched in a number of other cities. Knight-Ridder has negotiated joint venture agreements with publishers in 17 cities and plans to offer Viewtron alone in five others where it publishes newspapers.

To Set the Standard?

Prospective videotex developers across the country are closely watching Viewtron not only because it is the first commercial service to become operational in the U.S., but also because the Sceptre terminal is the first one to implement the North American Presentation Level Protocol Syntax (NAPLPS), a graphics display format adopted earlier this month as a U.S. standard by the American National Standards Institute.

Although NAPLPS produces better graphics than its chief rival — Britain's Prestel system — the Viewtron terminal, at \$600, is considerably more expensive than Prestel terminals. One big question is whether NAPLPS graphics will attract a sufficient number of subscribers willing to pay \$600 for the hardware and a sufficient number of advertisers. These are a videotex system operator's main revenue sources.

It may be significant that the *Los Angeles Times*, which plans to begin offering a videotex service next summer to 880,000 households in Southern California, also has chosen the Sceptre terminal, but will rent rather than sell the device, at least initially.

Viewtron charges approximately \$12/mo for data base service and \$1/hour for communications; in addition, the subscriber has to pay \$600 up front for his terminal.

By comparison, the charge for the *Los Angeles Times'* Gateway service will be about \$35/mo, a spokesman said. That cost will cover the terminal rental fee plus the service charge. Subscribers will access the data base through a local dial-up, or 800-service, telephone call, so there will be no charge for communications.

Correction

An article announcing Paradyne Corp.'s PDN5200 packet-switching system [CW, Oct. 24] should have specified that the product implements the packet switch recommendation of the Consultative Committee on International Telegraph and Telephone (CCITT), not ITT.

This Week

IN DEPTH

Software Workers Survey	Follows Page 102
Can the People's Republic Catch Up?	ID/15
SNA Primer for Programmers	ID/33
On-Line Insurance	ID/45

NEWS

Apple Says Earnings Will Remain Depressed	4
IBM, Bell and Sperry Scrap Josephson Research	5
Circuitous Route Leads Exec to Telecom Post	6
User's Tests Jibe With Tandem Claims for TXP	9
Tool Helps Firm Compare DBMS Performance	13
SEC Plans Electronic Filing of Disclosure Forms	14
Felony Charges Filed Against Alleged Hacker	15
Japan Readies Backbone Cable for ISDN	16
Hacker Debate Continues at Security Meet	17
DP Law Forum Addresses Software Piracy	18
Managers on the Move	22
More Seen to Contracts Than Price, Delivery	23
Turnaround Time	24
Most Senior Accountants Found Using Micros	26
Denmark First to Shred Paper Securities for EFT	29
Chinese Engineer Outlines China's DP Security	30
International Report	31
MIS Manager 'Must Become Agent of Change'	32
Computers Seen Moving to Industry Front Lines	35
Report Writer 'Travels' With User's Auditors	36
Printers Handle Output From Different CPUs	38
Paint Maker Finds Right Order, Invoicing Mix	40
Micro Features Available With Terminal-CPU Link	41
UW Library Testing On-Line Card Catalog	44
Petroleum Firm Strikes Oil With Local Net	45
Supermini Software Cleans Sassoon DP Shop	47
Hardware Firm Stays Current With T/S Service	48
Workstation Rules Out Paperwork for Court	50
Mini Helps Manufacturer Integrate Operations	51
Chemical Firm Discovers Productivity Formula	53
Mini Helps Children's Home Handle Reporting	54
Operating System Saves Cost of Programmer	55
UK Professor Wins Warnier Prize	56
Tool Helps Bechtel Rewrite Application Library	58
Engineers' WP System Cuts Prep Time by 85%	59

EDITORIAL

Editorial: New Kids on the Block	78
Lecht on Science: PCjr's First Halloween	79
Reader Commentary: Programmers Can Write	79
Reader Commentary: Micros Aid in Applications	80
Reader Commentary: DP Auditing	82
Reader Commentary: DP Hacker Threat	84

SOFTWARE & SERVICES

Consider Performance in Choosing DBMS	85
File Manipulation Tool Launched	86
TSX-Plus Update Boasts RT-11 Compatibility	87
Security Package Available for IBM's CICS	88
Datamate Offers Report Writer for VAX-11s	90
Program Processes Employee Medical Claims	91
Nova*GKS Tool Incorporates GKS Standard	92
Communications Equipment Manager Debuts	93
'Design Graphix' Fits RSX-11M	96
Relational DBMS Out for DEC's Professional	98
Tool for Oil Industry Runs on Datapoint CPU	100
Engineering Data Base Provides Fiche Files	102

COMMUNICATIONS

Mobil Unveils On-Line Payment Project	103
'Multipoint Network Design' Fits IBM Micros	104
Limited-Distance Modem Unveiled	106
Response Time Analyzer Out for IBM Net Users	109
Processor Emulates IBM Controllers	112

SYSTEMS & PERIPHERALS

Plexus Unleashes Back-End Processor	117
Micro-Based Controller Supports DEC Systems	120
SMS Micro/TSX-Plus Compatible With PDP-11	122
Cartridge Tape System Targets IBM Series/1	123
Unit Provides Services to Micros Under CP/M	126
Disk Cache System Targets IBM Micro Users	128
Disk Controller Built to Optimize Unix Systems	133
Nuvec Labs Unveils Decentralized Systems	134
Computer-Aided Design System Fits Apple	141
Homes' Portable Drive Fits TRS-80 Model 100	142

OFFICE AUTOMATION

WP, E-Mail Seen Only the Beginning	149
Integration Package Out	150

COMPUTER INDUSTRY

House OKs Export Administration Bill	151
Micro Boom Fueling 3½-In. Microfloppy	151
SEC Inquiring Into DEC Officials' Stock Sale	152
Computer Devices Files for Chapter 11	155
Federal DP Service Contract Exemption Issued	158
Mostec: U.S. Needs to Open Trade With Japan	160
Shareholders Approve Harris-Lanier Merger	161
IBM Seen Poised for Communications Assault	162
DEC Unveils VAX Software Marketing Pacts	164

ADVERTISING INDEX

203



How do you spell relief from the pain of Documentation? (S-Y-D-O-C.)

Call (201) 568-9700.

Cut your COBOL
Maintenance
costs.



syncsort
INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

QUESTION: Which is a bigger headache? The COBOL-documentation problem or the high-cost-of-maintenance problem?

ANSWER: Both.

* * *

We're not kidding. Documentation and high maintenance costs are both parts of the same big headache. Here's why:

1. THE PROBLEM BEGINS WITH DOCUMENTATION: And it begins right at the program-development stage.

Most programmers hate to document. And although they may think they are producing well organized programs, they really have no way of judging. If they produce badly organized programs, they will inevitably produce badly organized documentation, too. One always equals the other.

2. BAD DOCUMENTATION LEADS TO COSTLY MAINTENANCE: Even if the documentation started out being accurate, it's probably never been updated. When modifications occur, someone's got to go back and attempt to divine the underlying logic before new code can be inserted. A long and costly operation.

No wonder COBOL maintenance may consume as much as 75% of your entire budget!

FAST RELIEF WITH SYDOC: Our Structured Documentation System takes the documentation problem off the shoulders of your programmers and puts it where it belongs—on the computer:

• **SYDOC HELPS YOU DEVELOP STRUCTURED PROGRAMS.** It not only provides structured documentation, it is also a very useful guide for the production of structured COBOL programs. Flaws and inconsistencies can be spotted at the development stage. And corrected before they start driving your maintenance costs up.

As a manager, you will—for the first time—have a tool to standardize both your documentation and the quality of your programs.

• **SYDOC MAKES IT EASY TO MODIFY EXISTING PROGRAMS.** It can analyze "orphan" programs without adequate documentation and tell you everything you need to know about the program's structure, logic, variables and relationships. Armed with this knowledge, the maintenance problem shrinks.

No longer is it necessary for skilled programmers to spend days searching for clues about the program's logic. SYDOC makes all necessary information available quickly and easily.

But the best way to find out about SYDOC is to try it. If this remedy doesn't work you'll just have to try another—A-S-P-I-R-I-N.

Apple Says Earnings Will Remain Depressed

By Peter Bartolik

CW Staff

NEW YORK — Apple Computer, Inc.'s chief executive last week warned Wall Street analysts that increased expenditures on new products will keep the company's earnings through next spring at the depressed levels reported Sept. 30.

"Major new products" will be announced early next year, including a 32-bit microprocessor, John Sculley, Apple's president and chief executive officer, told a gathering of analysts here. That microprocessor is universally believed to be the rumored Macintosh.

Two analysts with differing views of Apple's strategy agreed after the meeting that the company is betting much on the hope of carving out a market niche with the Macintosh.

Apple's earnings for each of the next two quarters ending Dec. 31 and April 1 "should not be expected to exceed the eight cents [per share] reported for 1983's fourth quarter, which ended on Sept. 30, 1983," Sculley said. Earnings in the \$5.1 million range reported in September would be significantly below the \$23.5 million reported last December and \$23.9 million reported last April.

It will take a year for Apple's earnings to return to the traditional return-on-equity level of about 25%, Sculley reported. "It is not in the best interests of our long-term business or our shareholders to compromise new product development, marketing

support of new products or development of enhancements to increase the competitiveness of existing products in order to show favorable short-term quarterly earnings results," he said.

Analysts' Reaction

While Sculley encompassed the Lisa and the Apple II microcomputers in his remarks, analysts told *Computerworld* after the meeting that the company is counting on a big splash with the Macintosh to spur consumer demand.

"They are betting the company on the Macintosh" is the way that Michele Preston, an analyst with L. F. Rothschild, Unterberg, Towbin, put it. Preston said Apple claims to have 100 companies developing software for the expected micro.

Preston concluded that Apple hopes to establish the Macintosh as a standard apart from the IBM Personal Computer and will need a "spectacular" splash to do so. "Everybody is going to be dazzled by it; the question will be, 'Do the users buy it?'" she said.

Donald Brown, analyst with Shearson/American Express, Inc., is not dazzled by the new micro and said the Macintosh strategy "has high potential, but high risks." He said Apple will start manufacturing "revenue-producing" Macintoshes within two weeks and will begin selling them in January for about \$2,500. For a "downgraded Lisa," he

said, that price is too high in comparison to IBM's recently announced PCjr models.

According to Brown's projections, the company will only post an earnings ratio of 60 cents per share when fiscal year 1984 closes out next September, with Apple II sales remaining flat and Lisa inventories staying high. In the fiscal year just ended, the company reported earnings of \$1.28 per share despite the poor fourth quarter.

IBM PCjr 'a Puny System,' Not Inexpensive, Says User

By David Myers

CW New York Bureau

IBM's newly introduced PCjr is "a puny system," one of the microcomputer's first users said last week.

"People are going to buy it thinking it's an inexpensive system and find they need a lot more expensive equipment to really run it," said William R. Parks, a professor of microcomputing at Maricopa Technical Community College in Phoenix.

A number of sources, including developers and builders in the personal computing aftermarket, told *Computerworld* last week that IBM deliberately designed the PCjr so it would not compete against the two-year-old Personal Computer.

"When [IBM] decided to go into this market, it essentially decided to make a machine that competes with the [Personal Computer]. So they built roadblocks into it to keep people from turning it [PCjr] into a cheap [Personal Computer]," said an executive with an electronics component manufacturer who asked that his name not be used.

It is those "roadblocks" that have made the PCjr a target of attack by users who had hoped the new micro [CW, Nov. 7] would run the same programs at home that the Personal Computer runs at the office.

People who want to expand the PCjr to its full capabilities, or even far enough to make it useful as an at-home extension of the Personal Computer, may have to invest more money than they had originally planned. For example, the basic \$669 PCjr must be fitted with a disk drive, modem and display monitor to make it usable by corporate managers, bringing its price to \$1,813. A similarly configured Personal Computer, with 128K bytes of random-access memory and one dual-sided floppy disk drive, costs \$3,169.

The biggest difference between the two machines is the keyboard. The PCjr's keyboard — an under-\$50 component manufactured by Advanced Input Devices, an Idaho company — has no function keys and has been described by some first users as "toylike."

The PCjr keyboard "makes [the computer] feel like a different machine [from the Personal Computer]. That's going to be the biggest stumbling block to use of the system by corporate managers," one industry consultant said.

A rival keyboard maker, who spoke to *Computerworld* on the condi-

tion that his name not be used, said the problem with the keyboard is its "nonstandard size." PCjr's keyboard has 62 keys — 21 fewer than its older brother — and the rectangular keys are widely spaced, more like a calculator's keypad than a typewriter's.

Because of the missing function keys, "there's no way this machine can be used at home by corporate managers. Someone who wants to run an accounting program, for instance, has to buy the other machine [the Personal Computer]," the keyboard manufacturer executive said.

Because of the keyboard's design, there is also some question of its durability. However, Peter Wezeman, vice-president of sales for Advanced Input Devices, who declined to say whether the company had produced the keyboard for IBM, said comparable products were rated for about 30 million operations.

Despite criticisms, however, few people believe IBM's smallest personal computer — built for the firm by Teledyne, Inc. — will fail to hit its target market.

"It's a dud, but so was the [Personal Computer] when it first came out," said Nick Cosentino, operations manager for Pure Data Ltd., a maker of multifunction boards for the Personal Computer and Personal Computer XT. Cosentino said the aftermarket helped win acceptance for the Personal Computer, and it will help win acceptance for the PCjr.

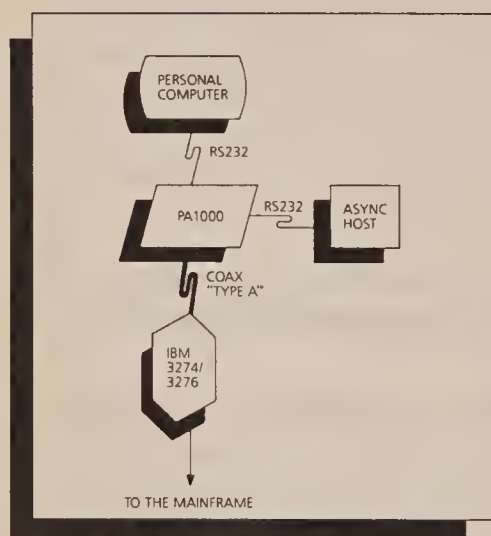
"[IBM's] master plan is to take all the business back themselves. They let suckers like us establish the market for them, then they come in and take it over," Cosentino said.

An IBM spokesman, however, disputed Cosentino's view, saying the technical reference manual on the PCjr would be available in IBM product centers in December.

IBM detractors disagree, pointing to the company's switch from Version 1.0 to Version 2.0 of the PC-DOS operating system at the introduction of the Personal Computer XT, believing it to be a tactic to discourage the aftermarket from cashing in on sales of the computer. PCjr runs under PC-DOS 2.1, raising fears that the company plans another operating system switchover.

Meanwhile, makers of expansion boards are rushing to get PCjr add-ons ready for market. Software writers are lagging behind, but said they should be ready with competing programs by the time PCjr shows up in the stores next February.

PERSONAL COMPUTERS OR TERMINALS... Connect Coaxially To An IBM 3274/76.



AVATAR's PA1000 gives any personal computer or terminal access to both IBM and mini-computer hosts. A simple keystroke is all it takes to switch from one host to another.

■ Supports DEC VT100, IBM3101, ADM5, Televideo, ADDS (plus many others) or any personal computer in terminal emulation mode.

- Allows the personal computer or terminal to emulate IBM 3278-2.
- Supports dial-in capability for portable computers or remote terminals.
- Microprocessor handles protocol conversions, terminal keyboard, screen management and printing functions.
- The IBM connection is a Type A coax to an IBM 3274/76 cluster controller.
- Supports BSC, SNA/SDLC or channel attached cluster controller.
- Low cost connection . . . \$995.

For more information, call 3R Computers, 18 Lyman Street, Westboro, MA 01581, (617) 366-5300 TWX 710-390-0375.

AVATAR™

© 1983 RRR Computers, Inc.
IBM is a registered trademark of International Business Machines Corp.

Refocus on Silicon, Gallium Arsenide

IBM, Bell and Sperry Scrap Josephson Research

By Tom Henkel
CW Staff

Josephson junctions, the super-cooled, superfast circuits that many researchers thought held the key to the next generation of computer systems, appear to have lost their glimmer.

IBM, Bell Laboratories and Sperry Corp., the three top firms experimenting with Josephson junctions, have scrapped their research in favor of silicon- and gallium arsenide-based research projects. Sperry cut back its Josephson project significantly in June, citing basic problems with the technology. IBM and Bell Labs officially halted Josephson research in the past two months, citing technical problems with building Josephson circuits that have severely impaired the possibility of manufacturing cost-effective, reliable Josephson-based processors.

The technology is based on a theory developed in 1962 by British physicist Brian Josephson which states that circuits become superconductive, or lose almost all resistance, when cooled to near absolute zero (about minus 400 F). To get down to that temperature, the circuits must be immersed in a very cold substance such as liquid helium.

While the severe cutbacks by Sperry, IBM and Bell Labs do not signal that research into Josephson junctions is dead — all three organizations, as well as academic and military researchers, are still investigating the Josephson effect. They indicate there are apparently too many problems with Josephson technology for it to be released as an economical, reliable commercial product.

Computer manufacturers are driven to adopt the most economical means to an end to attract customers, and Josephson technology currently cannot provide that means. The government and military may now lead Josephson research since the government's budget, fed by tax dollars, is not specifically geared toward the production of an economical end product.

Researchers Reassigned

IBM, which reportedly has spent more than \$100 million on Josephson research since 1976, has reassigned most of the 115 Josephson researchers at the Thomas J. Watson Research Center in Yorktown Heights, N.Y. The company also shut down an experimental Josephson manufacturing project at its East Fishkill, N.Y., plant that was part of the research and development effort.

About one sixth of IBM's Josephson research team will continue to work on cryogenic devices, an IBM spokesman said. They will work on gallium arsenide- and bipolar silicon-based devices.

Bell Labs, which one industry watcher estimated has spent about \$50 million to \$75 million on Josephson, has reassigned all but one or two of its Josephson researchers and has stopped all development of Josephson devices. Thomas Fulton, a member of the technical staff at Bell Labs, said in a telephone interview last

week that the Josephson project started to wind down about a year ago, when lead researchers on the project decided to refocus their efforts on gallium arsenide and optics research.

However, the researchers' refocusing was not done in an effort to find a replacement for the Josephson technique, Fulton noted.

"We could show no immediate application [for Josephson junctions] in telecommunications," a Bell spokesman said, adding that technical problems with the Josephson technique made its use appear unrealistic when compared to recent advances in gallium arsenide and silicon devices.

Sperry, which has been researching the Josephson effect for about as long as IBM, virtually killed its Josephson project because of problems in maintaining the low temperature conditions required to promote the Josephson effect, a spokesman told *Computerworld* last week. The spokesman added that Sperry could not give an accurate estimate of how much it has spent on Josephson research because the research is bundled into other projects, such as silicon and gallium arsenide research.

Sperry has refocused most of its research on gallium arsenide, the spokesman said, adding that gallium arsenide appears to offer the poten-

tial of surpassing the performance expected from Josephson junctions.

Some scientists thought Josephson junction devices held the potential of offering circuits with sub-nsec switching speeds. A Bell Labs experiment developed a series of 548 Josephson circuits with internal switching speeds of about 1 nsec. However, the actual switching speed of the Josephson device was 75 nsec, about three times that of currently available mainframe processors. Bell attributed this to the long distances the information had to travel from the liquid helium bath to the parts of the equipment at room temperature [CW, July 5, 1982].

YOURDON CURRICULUM 1984.

STRUCTURED TECHNIQUES

ADVANCED STRUCTURED ANALYSIS (5 Days)

Jan 23-27 Los Angeles
Feb 6-10 Chicago
Mar 5-9 Long Beach
Mar 12-16 San Francisco
Mar 19-23 New York

MANAGING PROJECTS IN THE STRUCTURED ENVIRONMENT (2 Days)

Jan 16-17 San Francisco
Jan 25-26 Jacksonville
Feb 6-7 New York
Feb 27-28 St. Louis
Mar 12-13 Chicago
Mar 22-23 Houston

STRUCTURED ANALYSIS AND DESIGN WORKSHOP (5 Days)

Jan 16-20 Boston
Jan 16-20 Minneapolis
Jan 16-20 New York
Jan 16-20 Salt Lake City
Jan 23-27 Denver
Jan 23-27 Pittsburgh
Jan 30-03 Dallas
Jan 30-03 Washington, DC
Feb 6-10 Atlanta
Feb 13-17 Detroit
Feb 27-02 Indianapolis
Mar 5-9 Philadelphia
Mar 12-16 Hartford
Mar 19-23 Chicago
Mar 19-23 San Francisco
Mar 26-30 Seattle

STRUCTURED ANALYSIS AND SYSTEM SPECIFICATION WORKSHOP (5 Days)

Jan 16-20 Chicago
Jan 16-20 New York
Jan 23-27 Boston
Jan 23-27 Columbus
Jan 23-27 Seattle
Jan 30-03 Omaha
Jan 30-03 Washington, DC
Feb 6-10 Milwaukee
Feb 6-10 San Francisco
Feb 13-17 Boston
Feb 13-17 Cleveland
Feb 13-17 Long Beach
Feb 13-17 Malville, LI (NY)
Feb 27-02 Houston
Feb 27-02 Philadelphia
Mar 5-9 Denver
Mar 5-9 Honolulu
Mar 12-16 Detroit
Mar 12-16 Miami
Mar 12-16 Minneapolis
Mar 12-16 Phoenix
Mar 19-23 Santa Fe
Mar 26-30 Atlanta

STRUCTURED ANALYSIS FOR REAL TIME SYSTEMS (5 Days)

Jan 18-20 Houston
Jan 23-27 San Francisco
Jan 30-03 Long Beach
Feb 6-10 Washington, DC
Feb 13-17 Denver
Feb 27-02 Phoenix
Mar 5-9 Honolulu
Mar 12-16 Atlanta
Mar 12-18 Chicago
Mar 19-23 Boston

STRUCTURED ANALYSIS FOR USERS (3 Days)

Jan 4-8 Long Beach
Jan 11-13 Chicago
Feb 6-8 Philadelphia
Feb 13-15 Palo Alto
Mar 12-14 Phoenix

STRUCTURED PROGRAMMING WORKSHOP (5 Days)

Jan 16-20 New York
Feb 27-02 Washington, DC

STRUCTURED DESIGN WORKSHOP (5 Days)

Jan 16-20 Boston
Jan 16-20 Portland
Jan 30-03 Denver
Feb 6-10 New York
Feb 6-10 Washington, DC
Feb 27-02 Detroit
Feb 27-02 San Francisco
Mar 5-9 Chicago
Mar 5-9 Houston
Mar 12-16 Seattle
Mar 19-23 Minneapolis

STRUCTURED DESIGN AND PROGRAMMING WORKSHOP (5 Days)

Jan 16-20 Phoenix
Jan 23-27 San Francisco
Jan 30-03 Milwaukee
Feb 6-10 Dallas
Feb 6-10 Pittsburgh
Feb 13-17 Minneapolis
Feb 27-02 San Diego
Mar 5-9 New York
Mar 12-16 Anaheim
Mar 12-18 Oklahoma City
Mar 12-16 Washington, DC
Mar 19-23 Indianapolis
Mar 26-30 Philadelphia

STRUCTURED DESIGN FOR REAL TIME SYSTEMS (5 Days)

Jan 16-20 Long Beach
Jan 23-27 Chicago
Feb 6-10 Palo Alto
Feb 27-02 Houston
Mar 12-16 San Diego
Mar 19-23 Phoenix
Mar 26-30 Washington, DC

STRUCTURED QUALITY ASSESSMENT WORKSHOP (3 Days)

Jan 9-11 San Francisco
Feb 13-15 Boston
Mar 19-21 Dallas
Mar 26-28 Washington, DC

STRUCTURED SYSTEMS DEVELOPMENT (1 Day)

Jan 4 Philadelphia
Jan 9 Dallas
Feb 6 San Diego
Feb 27 Charlotte
Mar 5 Raleigh
Mar 19 Indianapolis

DATABASE INFORMATION MODELING WORKSHOP (5 Days)

Jan 16-20 Denver
Jan 16-20 Raleigh
Jan 16-20 Washington, DC
Jan 23-27 Salt Lake City
Jan 30-03 Hartford
Feb 6-10 Seattle
Feb 13-17 Chicago
Feb 13-17 Philadelphia
Feb 27-02 Los Angeles
Feb 27-02 New York
Mar 5-9 Boston
Mar 5-9 Dallas
Mar 12-16 Milwaukee
Mar 19-23 Indianapolis

MICROPROCESSOR

STRUCTURED ANALYSIS FOR MICROPROCESSORS (5 Days)

Mar 19-23 Chicago

STRUCTURED DESIGN AND PROGRAMMING WORKSHOP FOR MICROPROCESSORS (5 Days)

Feb 13-17 Chicago

MANAGEMENT IMPLICATIONS OF STRUCTURED TECHNIQUES FOR MICROPROCESSORS (2 Days)

Feb 13-14 New York
Mar 19-20 Boston

AUDIT, CONTROL AND SECURITY

AUDITING STRUCTURED ANALYSIS AND DESIGN WORKSHOP (5 Days)

Feb 6-10 New York
Mar 5-9 Houston

SPECIAL PRESENTATIONS

SYSTEMATIC SOFTWARE TESTING (2 Days)

Jan 5-6 Philadelphia
Feb 13-14 Chicago
Mar 19-20 San Francisco
Mar 26-27 Phoenix

PROJECT PLANNING AND CONTROL WORKSHOP (5 Days)

Jan 16-20 Memphis
Jan 30-03 Indianapolis
Jan 30-03 New York
Feb 6-10 Salt Lake City
Feb 13-17 Chicago
Feb 27-02 Boston
Feb 27-02 San Francisco
Mar 5-9 Anaheim
Mar 12-16 Denver

ARTIFICIAL INTELLIGENCE (3 Days)

Jan 16-18 Anaheim
Feb 6-8 Washington, DC
Mar 5-7 New York
Mar 12-14 Chicago

INTRODUCTION TO COMPUTER CONCEPTS (3 Days)

Jan 16-18 Atlanta
Feb 6-8 Detroit
Mar 19-21 New York

DEVELOPING BUSINESS DP SYSTEMS - A MANAGEMENT BRIEFING (2 Days)

Feb 8-9 Indianapolis
Feb 23-24 Chicago
Mar 12-13 New York

BASIC SYSTEMS ANALYSIS (3 Days)

Jan 9-11 Philadelphia
Feb 6-8 San Francisco
Mar 12-14 Phoenix

PROJECT LEADERSHIP LABORATORY (3 Days)

Jan 23-25 Houston
Feb 13-15 Baltimore
Mar 12-14 San Francisco
Mar 20-22 Columbus

TEAM MANAGEMENT WORKSHOP (2 Days)

Jan 12-13 New York
Jan 30-31 San Francisco

Feb 9-10 Dallas
Feb 27-28 Boston
Mar 12-13 Detroit
Mar 19-20 New Orleans
Mar 22-23 Atlanta

IMPACT OF THE COMPUTER REVOLUTION (2 Days)

Jan 23-24 New York
Feb 6-7 Washington, DC
Mar 5-6 Chicago
Mar 26-27 San Francisco

IN CONJUNCTION WITH ATP

CICS/VS MACRO LEVEL CODING (5 Days)

Jan 23-27 Boston
Mar 19-23 Washington, DC

CICS ON-LINE APPLICATION DESIGN (4 Days)

Feb 27-02 San Francisco
Mar 5-9 New York

FOCUS (3 Days)

Jan 16-18 St. Louis
Feb 6-8 Chicago
Mar 26-28 New York

IMS APPLICATION PROGRAMMING WORKSHOP (5 Days)

Jan 16-20 Houston
Feb 6-10 Philadelphia
Feb 13-17 Chicago
Mar 12-16 New York
Mar 26-30 Denver

MVS INTERNALS AND SUPERVISOR ABEND DEBUGGING (5 Days)

Jan 16-20 Chicago
Feb 13-17 Houston
Mar 12-16 Philadelphia

MVS OPERATOR TRAINING (3 Days)

Feb 13-15 Greenwich
Mar 5-7 Portland

VSAM USING ACCESS METHODS SERVICES (AMS) (3 Days)

Mar 19-21 St. Louis

YOURDON

For information, course outlines or to register for a course, call toll-free 800-223-2452. Yourdon New York (and Canada) 1133 Ave. of the Americas N.Y., N.Y. 10036 (212) 391-2828. Yourdon West 851 Traeger Ave., Suite 350, San Bruno, Ca. 94066 (415) 871-2800. Yourdon Washington D.C. 7927 Jones Branch Dr., Suite 400, McLean, Virginia 22102 (703) 790-0616/0617. Yourdon Europe 15/17 Ridgmount, London WC 1E 7BH England 01-637-2182.

Circuitous Route Leads Exec to Telecom Post

By Katherine Hafner
CW Staff

MEMPHIS, Tenn. — Patrick Greenish's career path has been a circuitous route to the top. Recently appointed vice-president of international telecommunications for Federal Express Corp., he is an attorney whose involvement in data communications came by way of his legal practice.

The 35-year-old Greenish was born in Morocco and raised in Western Europe. He received his bachelor's degree in secondary education from St. Francis College in Loretto, Pa., and later graduated from Western New England College in Springfield, Mass., with a law degree.

Greenish had a private law prac-

tice from 1976 to 1978, then went to Western Union International, Inc. in New York City as a corporate attorney.

It was at Western Union International that he gained the technical knowledge of telecommunications that would catch the eye of Federal Express.

"At [Western Union] I received an overview of the working of international telecommunications operations ... the various circuitry and services offered between the U.S. and international points, including a basic understanding of the European packet-switched networks and interface requirements between Europe and the U.S.," Greenish recalled.

In 1982, Greenish was made director of European international relations at Western Union. He was in Europe when he crossed paths with some Federal Express executives. "Federal was looking for someone with a telecommunications background. Throw that in with a little bit of legal background, and mine was exactly the type of experience they were looking for."

Legal Background

"My legal background will help me out a great deal in this job," Greenish added. "We're in the process of setting up an international telecommunications department that will require some sort of entity overseas."

In his new position, Greenish is in charge of the international portion of Federal Express' planned electronic delivery service as well as setting up the international network for data processing.

The new electronic delivery service, expected to go into operation between April and July of next year, involves sophisticated facsimile transmission of documents with guaranteed two-hour delivery.

"One of the requirements of my job is to have an understanding of overseas international telecommunications and monopolies," Greenish said.

"My tenure at Western Union prepared me for that. I also have good



"I think I know enough to get me by, but I wouldn't want to hold myself up as having any expertise in the telecommunications area," says Patrick Greenish, Federal Express' newly appointed vice-president of international telecommunications, who started his career as a lawyer. "I've always relied on others for that."

experience with the line requirements and procurement requirements to set up the network. I think I have an added advantage in that I'm in a better position to figure out where we can establish subsidiaries."

Greenish is the first to admit that his strength does not lie in technical matters.

"I think I know enough to get me by, but I wouldn't want to hold myself up as having any expertise in the

telecommunications area," he said. "I've always relied on others for that."

Greenish's job was created when the international network grew to the point where a separate director was needed to handle the project.

"It's a little overwhelming right now because I have to develop a staff," Greenish said. "But Federal Express is a great place to work. It's a very people-oriented company."

How Charles E. Ames

"dumped the dumb"

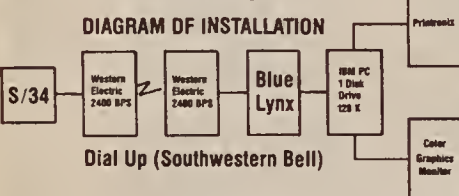


You'd be hard pressed to find someone who keeps up with IBM's smaller systems better than Charles E. Ames does. He's president and editor of Basic Society News, an independent journal devoted to the subject.

When Charles found out about BLUE LYNX 5251 terminal emulation for the IBM Personal Computer, he saw an immediate answer for a pressing need.

"We were using a System/34 in Fort Worth, doing our programming in Dallas and driving 50 miles to Fort Worth to run them. Then driving 50 miles back to Dallas for more programming. This was happening three times a week. With Metroplex traffic being what it is, this was a real drag!"

BLUE LYNX was the economical way to eliminate the tiresome commute. "Now with BLUE LYNX on our PC we just dial up the S/34 in Fort Worth any time we wish. The first time we tried it, it worked. And it has been working ever since."



Charles conducted his own torture-test of the setup: "We left the telephone line open for two weeks. That's seven days per week and 24 hours per day. We wanted to see if it would work. It did."

Our terminal packages include:

3276 emulation with SNA/SDLC or Bisynch, hardware and software package \$690 complete or \$1230 complete for SNA/SDLC and Bisynch, software selectable. Available now.

5251 emulation for S/34, S/36 and S/38 users, hardware and software package \$690 complete. Available now.

Software and support by Software Systems, Inc.

VTterm-DEC VT100/52 emulation software package (requires IBM Asynchronous Communications Adapter or equivalent) \$125. Available now.

Why play dumb? Dump the dumb with BLUE LYNX.

TECHLAND SYSTEMS, INC.

25 Waterside Plaza
New York, NY 10010

(212) 684-7788

BLUE LYNX is a trademark of
Techland Systems, Inc.



House Poised for Final Vote on Bill Prohibiting Phone Net Access Charges

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — Legislation that would wipe out the rate cuts recently proposed by AT&T for many business communications services was up for a final vote in the House of Representatives last week as *Computerworld* went to press.

The bill, H.R. 4102, would prohibit the Federal Communications Commission (FCC) from imposing surcharges next April on residential and single-line business customers for accessing the long-distance telephone network.

It would also require users of bypass facilities to help pay for the upkeep of local exchange networks.

The surcharges are a key part of an FCC plan to change the way local telephone companies are reimbursed

for providing access to the long-distance network.

A \$6.5 Billion Tab

Today, long-distance carriers pay for this service and pass on the charges to their customers; the tab comes to about \$6.5 billion annually.

Under the FCC's access charge plan, a major portion of this \$6.5 billion would be paid directly by all users of local telephone service. Residential and single-line business users would contribute roughly a third of the total amount next year and approximately two-thirds beginning in 1989.

Part of the rest of the \$6.5 billion would come from multiline business subscribers in the form of a monthly surcharge on each local loop. The balance would be paid by long-dis-

tance carriers, which would pass on the charges to their customers.

If H.R. 4102 is enacted, much of the residential/single-line business users' share of the \$6.5 billion will have to be assumed by multiline business subscribers.

AT&T, which recently proposed a new tariff based on the FCC plan — one offering substantial rate cuts to users of longer distance and/or higher bit-rate services — has said it will cancel the reductions if the legislation is enacted.

Before that can happen, the full Senate must vote on a companion bill (S. 1660), and any differences between the House and Senate measures will have to be worked out by a conference committee.

Senate action on the above is scheduled next month.

For document and text management

Theirs:

STAIRS

Ours:

INQUIRE®

With large volumes of textual material now available in computer-readable form, the indexing, storage, and retrieval of full text has become both an opportunity and a problem for managers of: corporate records, regulatory affairs, corporate libraries, research, and litigation support. IBM has recognized that text management is a critical part of overall information resource management.

They've got the right idea, but the wrong tools.

What about applications which mix text and numbers? How efficient is it to add documents? Can indexing approaches be matched to the application? How flexible is the output formatting?

INQUIRE provides an interactive approach to text management in a single, integrated information resource management system. The INQUIRE thesaurus manager provides vocabulary control and interactive thesaurus-aided retrieval. Users have complete control over output formatting. INQUIRE offers contextual (proximity) searching of text, as well as numeric computation and qualification. And INQUIRE is efficient—no reorganization is needed when documents are added.

One client says it all. "We converted our entire corporate records system from STAIRS to INQUIRE in three weeks, saving \$2,400/month in software costs alone."

We've been helping companies meet complex document and text management challenges

since 1968. If you run MVS, VSI, or VM/CMS, INQUIRE can make text a valuable part of your information resources. Call us toll free today to find out how.

Infodata

Infodata Systems Inc.
5205 Leesburg Pike
Falls Church, Virginia 22041

800-336-4939

In Virginia, call 703-578-3430
Telex: 899-125

Offices in:
Dallas, Houston, Los Angeles, New York, Rochester NY,
Washington DC, Chicago, Tampa, San Francisco,

®INQUIRE is a registered trademark of
Infodata Systems Inc.

© 1983 Infodata Systems Inc.

Tandem Adds Communications Front End

(Continued from Page 1)

360 lines. In addition, each line can be individually microprogrammed by transmission and line type, electrical interface, protocol and communications speed, allowing a broad assortment of line configurations to coexist in the same network, the spokesman said.

Communications attributes of the processor include:

- Three transmission types — asynchronous, byte synchronous and bit synchronous.
- Two line disciplines — point-to-point and multipoint.
- Two electrical interfaces — RS-232 and V.24/V.28.
- Multiple protocols capable of supporting the IBM 3270 terminal,

2780/3780-class equipment, X.25 packet switching and Tandem's own video display units and point-of-sale terminals.

- Transmission rates ranging from 50 bit/sec to 56K bit/sec.

An important difference between Tandem's latest front-end processor and its three predecessors is that the enhanced product assimilates many of the communications functions previously assigned to facilities like interrupt handlers, controllers and system processes. The 6100 cuts a central mainframe's communications overhead by 20% to 40% and in so doing frees the machine to devote its resources to practical applications, the spokesman said.

The most recent addition to Tan-

dem's front-end processor family consists of two main parts: communications interface units and line interface units. The communications interface units support either Tandem's Non-Stop II or TXP mainframes and are always connected to two such CPUs at the same time.

To ensure the continuous processor availability that has become the hallmark of Tandem's Non-Stop architecture, the communications interface units are installed in pairs, with up to three pairs able to operate with each dual-CPU complex. If one of the communications interface units in a pair breaks down, its twin will automatically fill the breach and allow its two associated mainframes to continue operating without inter-

ruption or performance degradation, the spokesman said.

Every communications interface unit pair controls as many as 15 line interface units, each of which corresponds to a different communications line, the spokesman said. The line interface units consist of two printed circuit boards, a line interface module and a communications line interface processor. Housed in their own separate enclosure, the line interface units can be situated up to 200 feet from their cooperating communications interface units.

As their name suggests, the line interface units provide the 6100's transmission lines with their necessary electrical and mechanical interfaces. The communications line interface processors are the modules that allow each of the lines to be individually programmed with its own mix of communications attributes.

To define or revise a given line's protocol, users need only to download the microcode from their Tandem mainframes to the appropriate communications line interface processor, which holds its own dedicated microprocessor and 64K bytes of random-access memory (RAM).

In addition to permitting lines to be configured independently, a communications line interface processor's on-board microprocessor and RAM enable the 6100 to be easily upgraded to support future communications capabilities as they become available, the spokesman said.

Tandem has already announced its intention to make the 6100 compatible with IBM's Systems Network Architecture by the end of next year.

A basic 6100 subsystem configured with two communications interface units costs \$23,900, with each line interface unit selling for an additional \$1,940. Tandem is located at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

Groups Denied Tax Exemption

(Continued From Page 1)

dent Raymond J. Grande, the open-door policy has created problems. Prime has refused to send representatives to PUG-East this February in Baltimore because non-Prime vendors will be present.

Lenharth said the IRS appears to be putting users groups in a no-win situation. If the groups deny other vendors the opportunity to participate in and display products at meetings, tax-exempt status will be denied because the users group has too narrow a focus. However, if all vendors are allowed to participate and display products, the IRS will consider the meetings trade shows and also deny tax exemption.

Tom Clark, who publishes an independent newsletter for users of Burroughs Corp. hardware, said the IRS ruling may have an adverse impact only on organizations like the Cooperative Users of Burroughs Equipment if the organizations turn a profit. As long as the users groups spend all the money they take in over the course of a year, tax-exempt status should not be an issue, he said.



POWER SYSTEMS FOR COMPUTERS

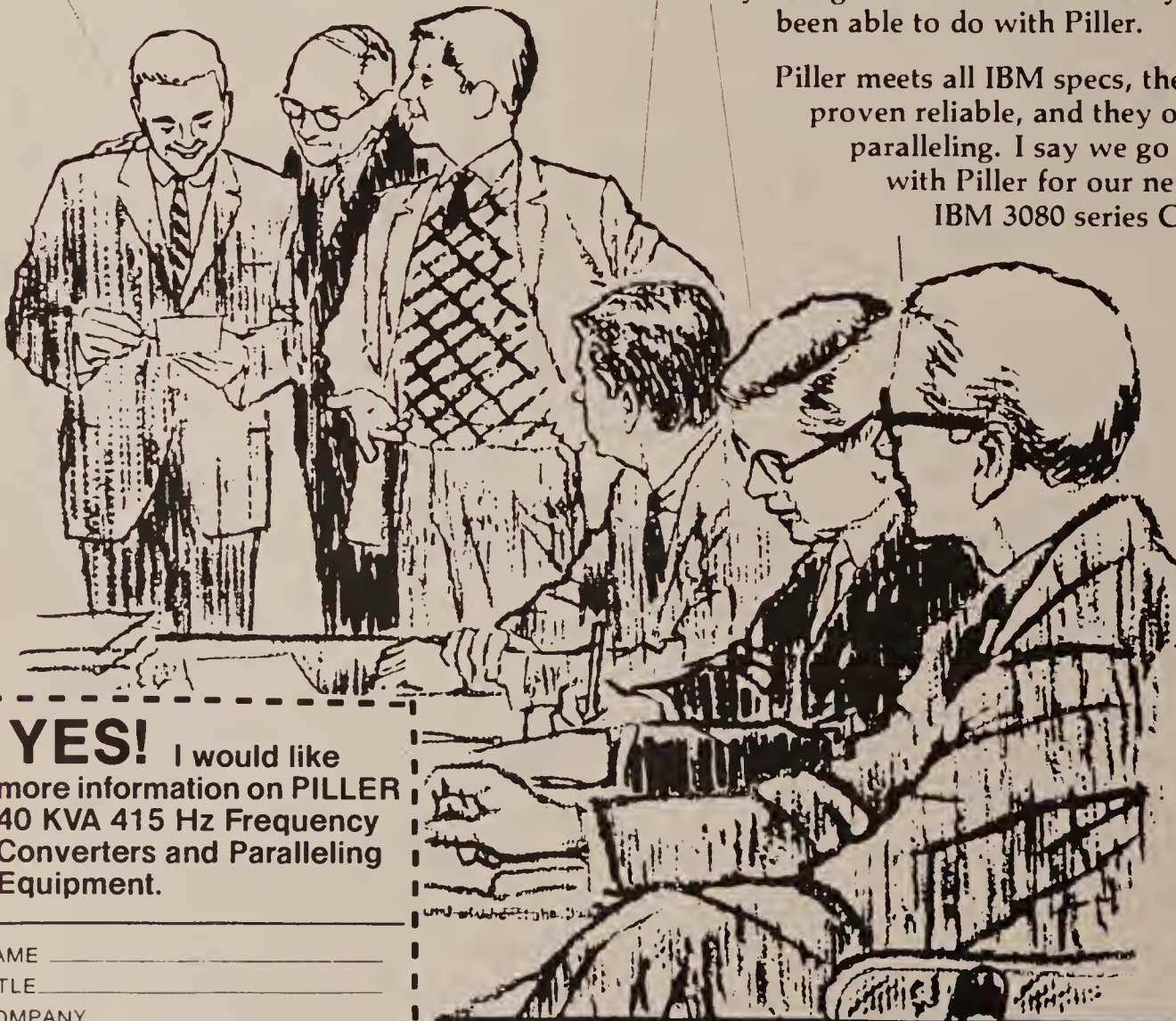
I hear that IBM is now offering a Model 3089 415Hz frequency converter for their 3081 series mainframes.

That's right. But we've been using Piller 415Hz frequency converters on all our IBM CPUs for years, and their 40 KVA unit is designed for IBM's 3081, 3083 and 3084 CPUs.

And the Piller Silentblock units have the highest reliability available in the industry.

I don't think IBM offers paralleling with their 3089. That means we won't be able to parallel for redundancy or system growth as we have always been able to do with Piller.

Piller meets all IBM specs, they're proven reliable, and they offer paralleling. I say we go with Piller for our new IBM 3080 series CPU.



YES! I would like more information on PILLER 40 KVA 415 Hz Frequency Converters and Paralleling Equipment.

NAME _____
 TITLE _____
 COMPANY _____
 STREET _____
 STATE _____ ZIP _____
 TELEPHONE _____
 WE INTEND TO: ☐ BUY ☐ LEASE

CW 11/14



CONTROL SYSTEMS, INC.

South Plank Road, Middletown, New York 10940
 Phone: (914) 355-6741 TELEX No. 13-7428

Vendor's 32-Bit Non-Stop CPU User's Tests Jibe With Tandem Claims for TXP

By Jeffry Beeler

CW West Coast Bureau

SACRAMENTO, Calif. — One of the beta test sites for Tandem Computers, Inc.'s first 32-bit processor has confirmed the vendor's claim that the recently introduced machine [CW, Oct. 24] has two to three times the performance of its most powerful sister system.

During a recent benchmark test at System Integrators, Inc., a configuration built around three Tandem TXP processors reportedly delivered 2½ to three times more computing power than a similarly configured cluster of Tandem's older Non-Stop IIs.

The test results jibe almost exactly with the performance claims that Tandem made for the TXP when the transaction processing machine was formally introduced during an Oct. 18 press conference held in New York.

Founded about 10 years ago, System Integrators ranks among Tandem's largest OEMs, according to Jack Pritchard, who is the users organization's general director of marketing.

For years, the company has bought large quantities of Non-Stop mainframes and then resold them as modules in an electronic publishing system that allows newspapers and magazines to automate their editorial, production and advertising functions.

At some unspecified time in the future, System Integrators will probably begin to upgrade its current product line by expanding its selection of Tandem processors to include the month-old TXP, Pritchard maintained.

Under Own Roof

But before it begins selling the TXP to its customers, the OEM insists on experimenting extensively with the mainframe under its own roof. System Integrators' effort to familiarize itself with the 32-bit machine began around Sept. 1, when the company installed its first TXP in its in-house research and development department.

The installation project calls for System Integrators to replace eventually its existing R&D system, built around four 16-bit Non-Stop IIs, with three 4M-byte TXPs. Among its main benefits, the conversion effort is expected to boost substantially the power of the company's new product development system, Pritchard predicted.

"Of course, we could achieve the same performance increase just as easily by simply installing some additional Non-Stop IIs alongside the ones we already have," he said, "but we decided instead to acquire some of the new TXPs in the hope of gaining some valuable hands-on experience with the machines."

Software Prep Tasks

For nearly two months after they first arrived at System Integrators' doorstep, the three TXPs occupied a section of the firm's manufacturing floor. There, for the better part of a week, company employees devoted themselves to a variety of software

preparation tasks that included loading the freshly uncrated processors with their necessary test information and data bases.

Then, in late October, the vendor began dismantling and transporting the CPUs from their original installation site to a permanent location in the organization's development area, where the products were slated to be reassembled and reactivated early this month.

For about two weeks beginning in late September, System Integrators conducted an assortment of performance comparison tests involving a three-processor Non-Stop II configuration and a similarly configured

TXP system.

In one of the tests, which lasted an hour and entailed the processing of almost 16,000 transactions, the vendor loaded the Non-Stop IIs to 50% of their capacity and then steadily increased the computing burden to 80% and 90%.

Responding to Applications

After observing how system performance changed in response to growing applications work load, the firm duplicated the procedure with a TXP-based configuration.

In the end, according to Pritchard, the 32-bit machines were found to process on-line transactions as much

as three times faster than their 16-bit predecessors — a finding that corroborates Tandem's own performance ratings.

The results of the independent benchmark tests also affirmed Tandem's earlier claim that the TXP is fully software-compatible with the Non-Stop II, Pritchard added, although "the system generation processes for the two machines are quite different."

That discrepancy between the transaction processing engines forced System Integrators to "regen" its TXPs before it could finally press them into service, according to Pritchard.

A practical course for both new and experienced software developers

Just published: How to Design and Develop Business Systems

If you have anything to do with developing business software...as a manager, a systems analyst, a designer, or a programmer...you should get a copy of a new book called *How to Design and Develop Business Systems*.

Why? Because this book presents an 8-phase, proven method that's guaranteed to make system development go more smoothly in your shop. You'll learn:

- the 8 development phases—2 to analyze the current system, 4 to design the new system, and 2 to implement the system
- how to overlap the phases to make the best possible use of your staff...and to keep the user happy by delivering the most critical parts of the system when he or she wants them
- why you must involve the user from Day 1 if you want the new system to be a success
- what tools make it easy for the user to explain the current system, to understand the new system, and to catch design mistakes early in development
- how to avoid creating piles of paperwork that no one ever looks at
- what data flow diagrams are, why you should use them, and how to use them so they're helpful...not a pain in the neck
- how and when data-dictionary techniques can help you describe the data for the system
- how to design the files or database for a system
- how to break the system down into logical functions and programs
- how to use structured programming to cut programmer time, speed up testing, and make the system easier to maintain

- how to simplify documentation and yet have all the information you need to make changes later on

In short, you'll learn down-to-earth ways to speed up development, cut down on bureaucratic paperwork, and create systems that are reliable and easy to maintain.

128,000-line system completed by one person in 12 months

Most of the tools you'll find in this book...like data flow diagrams, data dictionaries, and structured programming...aren't new. But let's face it. Much of what's been said about them is useless when it comes to developing a modern, interactive business system.

In contrast, this book focuses on practical ways to use these tools. And it fits all the steps together into a single method that works.

In fact, the author, Steve Eckols, used this method to develop a complete operational and informational system for a grain brokerage...an interactive system of about 128,000 lines of COBOL code.

Steve did the whole system himself, from start to finish, in a year. (That counts the 3 months he was available part-time to solve problems and provide enhancements after installation.) That averages out to more than 450 lines of tested COBOL code per day.

Now I admit, not everyone will reach that level of productivity. There are just too many variable factors you can't control. Still, I'm convinced you'll improve your productivity if you use this method.

At least it's worth a try. After all, if it's true that the average COBOL programmer produces less than 5,000 lines of tested COBOL code per year, what have you got to lose?

Why this book is effective

The main reason this book is so effective is that Steve uses the brokerage system as an example of every phase in the development method.

That means you'll see how the method works when it's applied to the complexity of a real system. You'll find out what advantages it offers over your current method. You'll gain plenty of real-life perspective if you aren't already involved in system development at your shop.

In short, you'll learn a lot more than you would from a book that uses trivial examples to illustrate complicated ideas.

So why wait?

If you want to improve system development in your shop, get a copy of *How to Design and Develop Business Systems TODAY*. It will show you practical ways to analyze, design, and implement systems more effectively...guaranteed, or your money back.

Ironclad Guarantee

You must be satisfied. Our books must help you on the job, or you can send them back for a full refund...no matter how many you buy, no matter how long you've had them.

Mike Murach & Associates, Inc., 4222 W Alamos, Suite 101, Fresno, CA 93711 • 209-275-3335

For COBOL users

One key to better systems is structured programming. It helps you create programs that are easy to code, test, debug, and...most important...maintain.

If you like the idea of structured programming but you haven't found a good way to use it, we have 2 books for you. The first, *Structured Programming for the COBOL Programmer*, shows you how to implement structured methods in your COBOL shop. The second, *The Structured Programming Cookbook*, is a reference that gives (1) standards for a structured COBOL shop and (2) 4 complete business programs in COBOL that you can use as models for new programs.

Mike Murach & Assoc., Inc., 4222 W Alamos, Suite 101, Fresno, CA 93711

SD1-1

Yes, Mike, I want to improve system development in my shop. Please send me _____ copies of *How to Design and Develop Business Systems* at \$20 each and/or the books indicated below. I must be completely satisfied, or I'll send the books back at any time for a full refund.

____ *Structured Programming for the COBOL Programmer*, \$15

____ *The Structured Programming Cookbook*, \$15

☐ Bill me for the books plus shipping and handling (and sales tax in California)

☐ Charge my _____ Visa _____ MasterCard:

Card number _____ Valid thru (mo/yr) _____

Cardowner's signature _____ (not valid without signature)

☐ I want to **SAVE** shipping and handling charges. Here's my check or money order for full payment. Calif. residents, please add 6% sales tax to your total. (Offer valid in U.S.)

Name & Title _____

Company (if any) _____

Address _____

City, State, Zip _____

Users Flock to Portable, Transportable Machines

TRANSPORTABLES¹

Microcomputer	RAM	Bits	Operating System	Number of Applications Included	Storage	Display	Price as of 6/83
Columbia Data Products VP Portable	128K	16	MS-DOS ³ CP/M 86 ⁴	9	2 Floppy Drives	9 in.	\$2,995
Compaq Computer Corp. Compaq	128K	16	MS-DOS	3	1 Floppy Drive	9 in.	\$2,995
Computer Devices, Inc. Dot 3000 A	64K	16	MS-DOS	—	1 Floppy Drive	10 in.	\$3,220
Corona Data Systems, Inc. Portable PC 2	128K	16	MS-DOS	3	2 Floppy Drives	9 in.	\$2,795
Dynallogic Info-Tech Corp. Hyperion	256K	16	MS-DOS	3	2 Floppy Drives	7 in.	\$3,790
Eagle Computer, Inc. ² Spirit XL	128K	16	MS-DOS CP/M 86	—	1 Hard Disk	9 in.	\$4,795
Non Linear Systems, Inc. Kaypro 10	64K	8	CP/M	6	1 Floppy Drive 1 Hard Disk	9 in.	\$2,795
Kaypro II	64K	8	CP/M	6	2 Floppy Drives	9 in.	\$1,795
Osborne Computer Corp. Osborne I	64K	8	CP/M	2	2 Floppy Drives	5 in.	\$1,795 Heavily Discounted
Otrona Corp. Attache	64K	8	CP/M	3	2 Floppy Drives	5½ in.	\$2,995
Radio Shack/Tandy Corp. ² TRS-80 Model 4P	64K	8	TRS-DOS ⁵	—	2 Floppy Drives	9 in.	\$1,799
Seequa Computer Corp. Chameleon	128K	8 16	MS-DOS	2	2 Floppy Drives	9 in.	\$1,995
Televideo Systems, Inc. ² Teletote I	64K	8	CP/M	3	2 Floppy Drives	9 in.	\$1,499

Shaded Machines Indicate IBM Personal Computer Compatibility
¹Source: International Data Corp.

²Data Provided by Vendor.
³MS-DOS from Microsoft, Inc.

⁴CP/M, CP/M 86 from Digital Research, Inc.
⁵TRS-DOS from Radio Shack.

(Continued from Page 1)

Bosomworth, president of International Resource Development, Inc. of Norwalk, Conn. "If your desk looks anything like mine, a small footprint is important."

The Specter of Instability

Transportables made their appearance on the computer scene two years ago, when Adam Osborne introduced the Osborne I, an 8-bit suitcase with bundled software and a peephole screen. The Osborne I "was a good deal for a two-disk system,"

Product Spotlight

Bosomworth said. "The portability was an extra."

Oscilloscope maker Non-Linear Systems, Inc. then jumped into the transportable fray with a somewhat larger screen and a plan to take much of Osborne's business away.

At last count, 27 companies were offering a transportable of some type. Even the staid Tandy Corp. recently repackaged its Model 4 into a

handy transportable machine and will this week begin offering it through its Radio Shack outlets, just in time for Christmas.

Roller-Coaster Times

Despite all this activity in the transportable market, the man who started the trend toward transportability in micros may have also started the trend that all the micro world

had been fearing — the shakeout.

Osborne's filing for protection under Chapter 11 this past September reminded many users that the micro business is still in the roller-coaster times of introduction and bankruptcy.

However, in spite of Osborne's misfortune, industry experts believe the transportable market is probably the most insulated from a shakeout. "Osborne had a management problem and a distribution problem," Levin explained. Osborne "got their dealers mad by announcing the Executive system [a more powerful version of the Osborne I, with extended features] without letting their dealers know."

The uncertainty generated by what appears to be the beginning of a shakeout has been one factor contributing to many users' hesitancy about buying a transportable. Perhaps to prove that they will remain a powerful force in the desktop market, transportables have added hard disks (Non Linear Systems, Inc.'s Kaypro 10) or IBM compatibility (Corona Data Systems, Inc.'s Portable PC 2) or both (Eagle Computer, Inc.'s Spirit XL).

The reliability of hard disk portables has been questioned by some, but almost everyone agrees that IBM compatibility is a good idea (see story at left).

The Briefcase Computers

The portables — those that are the size of a briefcase rather than a suitcase, such as the Sharp Electronics Corp. PC-5000 — are currently as small as computers can get without significantly losing the functions of a desktop computer.

With features such as a flip-up LCD (or, in the case of Grid Systems Corp.'s Compass, an electroluminescent display), portables are designed for easy travel. But most portables fall short of being categorized as full systems because it is difficult to carry

Hopping on Two Bandwagons at Once

Buying an IBM-compatible transportable computer is like hopping on two bandwagons at the same time, but there are a number of good reasons for doing so.

The most obvious reason is to be compatible with IBM's desktop Personal Computer.

The next reason is that there are barely enough IBM Personal Computers to go around; the average wait for delivery is six weeks. Even when

a user can get one, he pays extra for almost everything, such as disk drives and extended memory.

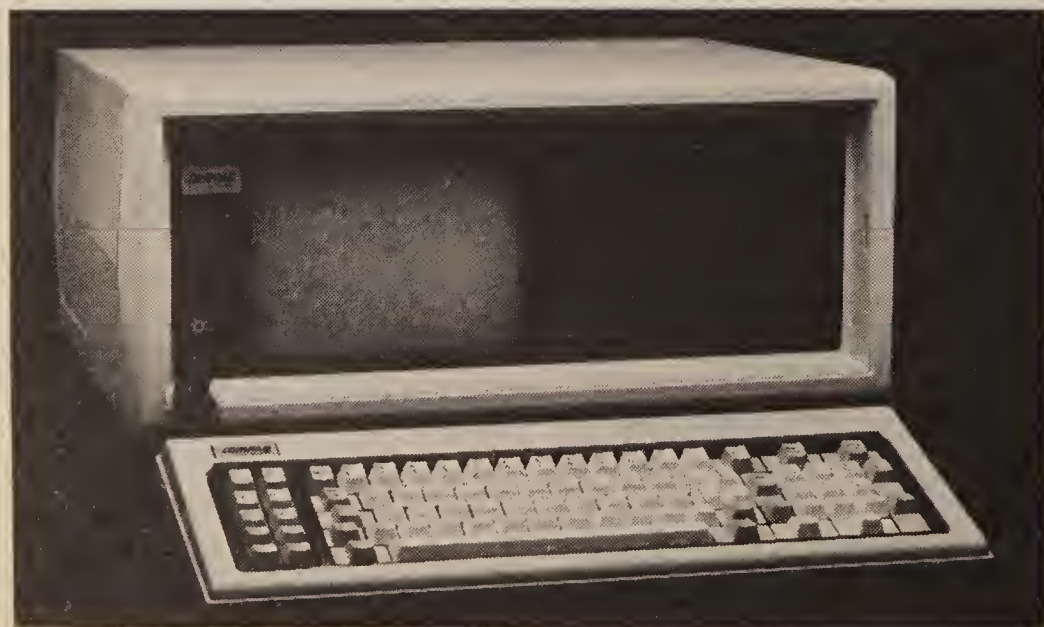
Compaq Computer Corp.'s 16-bit transportable (and most other compatibles), on the other hand, are sold complete with three software packages and one printer port bundled in for about the same price as a basic IBM Personal Computer.

While IBM is not expected to release a transportable or portable

computer anytime soon, at least six healthy companies offer transportables that are compatible with the Personal Computer (see chart). Although true compatibility is hard to measure, the clear leader in this market is Compaq, whose machine is so IBM-compatible that "even if IBM changes its operating system, Compaq will be in a good position to survive," Ellen Levin, an analyst with International Data Corp., said.

Osborne Computer Corp.'s shaky existence today, combined with uncertain futures for transportable makers like Computer Devices, Inc. — which, like Osborne, has filed for protection under Chapter 11 of the bankruptcy code — is yet another reason why users are looking for the security of an IBM environment.

Why isn't Big Blue planning to come out with a transportable? "IBM has a policy never to enter a market where other companies are making their living solely on the one product in that market," explained one industry watcher, who chose to remain anonymous. In other words, IBM will not attempt to put the transportable/compatibles out of business. Nor will it play "me too" to Compaq and others.



Compaq Computer Corp.'s IBM-Compatible Transportable

With Sales Seen Skyrocketing Through the '80s

PORTABLES								
Microcomputer	Dimensions	Bits	Built-In Modem	Storage	RAM	Display	Comments	Price
Convergent Technologies, Inc. Workslate	Notebook Size ¹	8	Yes	Microcassette Drive	16K	16 Lines x 40 Char. LCD	Microcassette Software Available	\$895
Commodore Business Machines Executive 64	5-in. x 14½-in. x 14½-in.	8	Yes	2 Floppy Drives	64K	6-in. Color Monitor	PET-Compatibility Optional	\$995
Epson America, Inc. HX-20	Notebook Size	8	No	Microcassette Drive	16K	3½-in. x 4 Lines x 20 Char.	Built-In Microprinter	\$795
Gavilan Computer Corp. Gavilan	9 lb. Briefcase Size	16	Yes	3½-in. Floppy Disk	80K	8 Lines x 80 Char. LCD	Touch-Panel Pointer Control	\$3,995 ²
Grid Systems Corp. Compass	9 lb. Briefcase Size	16	Yes	Bubble Memory + Cmos	256K	Flat Panel 24 Lines x 80 Char.	Runs MS-DOS Operating System	\$8,150 ²
NEC Home Electronics USA PC-8201	Notebook Size	8	No	Cmos	16K	8 Lines x 40 Char. LCD	17 Applications Packages Included	\$799
Radio Shack/Tandy Corp. TRS-80 Model 100	Notebook Size	8	Yes	Cmos	8K	8 Lines x 40 Char. LCD	Address Book and Schedule Data Bases Included	\$799
Sharp Electronics Corp. PC-5000	11 lb. Briefcase Size	16	No	Bubble Memory	128K	8 Lines x 80 Char. LCD	Attachable Thermal Printer Optional	\$2,500 ²

¹Notebook Size = Approximately 8½-in. x 11-in. x 1-3 in.
²As of June 1983

CW Chart

printers and disk drives in a briefcase. As Levin pointed out, portables are "usually supplements to other systems."

The briefcase portables vary widely in price and functions, with the Grid at the high end (\$8,150) and the Sharp at the low end (\$2,500). In the middle range, there is even what some industry watchers have called "the first designer computer" — Gavilan Computer Corp.'s Gavilan, which features a touch-panel cursor control.

Notebook-Size Computers 'Wholly Remarkable'?

By Jim Bartimo
CW Staff

In a current science fiction best-seller called *The Hitchhiker's Guide to the Galaxy*, the guide itself — repeatedly described as "a wholly remarkable book" — is not a book at all. Instead, it is a book-size computer containing most of the knowledge of the galaxy.

While today's notebook-size computers aren't quite as remarkable as the *Hitchhiker's Guide*, they provide users with a handy computer away from home, especially when traveling (or hitchhiking, as the case may be).

So handy are these computers that there will be some 140,000 of them at large in 1984 and 540,000 in 1987, according to Future Computing, Inc. They will account for \$154 million in retail sales in 1984 and \$486 million in 1987.

Although notebook-size computers are limited in application, what they can do is wholly remarkable. The three major notebook-size computers available today contain both a word processing package and a Basic compiler burned into the read-only memory (ROM); they need no ac outlet to operate (although a cord is provided for ac use and recharging).

Communications Software

Because they are designed mainly to supplement home or business computer systems, most of these "kneetops" come with communications software and can work with a

Future Computing expects the market for briefcase-size machines to grow from 100,000 in 1984 to 550,000 in 1987. This will account for \$330 million of the desktop market in 1984 and \$1.4 billion in 1987.

Some Limitations

While Hemphill believes these machines have a lot of power, "my

built-in or external modem.

The two notable points about these systems is that most of them feature a full-stroke keyboard and a price tag of \$1,000 or less.

With Cmos storage, the only thing these systems really lack is a better display. LCD is the preferred display today, but Kenneth Bosomworth of International Resource Development, Inc. pointed out that "flat panels are coming down in price," as are other display technologies.

At Best for Memos

The kneetops are perhaps at their best when they are used for writing short memos or programs, since even 32K bytes of random-access memory can be limiting. However, programs can be downloaded or uploaded with tape cassettes, and there seems to be plans to provide the lap-size machines with monitors and disk drives as well.

Third-party vendors are already bringing out additional tape cassette software and peripherals, such as the thermal microprinter about to be released by Teletex Communications Corp., but too many peripherals may detract from the unique portability these machines offer.

A relatively new entry into the notebook-size arena is Convergent Technologies, Inc.'s Workslate. Expected by some to open up yet another floodgate in the portable marketplace, the Workslate — with its "Chiclet" keyboard — is designed

(Continued on Page 12)

Product Spotlight

guess is that they're not going to take over the desktop machine because they'll always have some limitations. But they will have an impact."

Bosomworth credited the advent of the briefcase computer to three recent technological advancements — the modem on a chip; Cmos nonvolatile memory; and the reduction of memory in both size and cost. "A 256K-byte memory chip will cost \$10

next year," he said. "You can do a lot with 256K [bytes] of memory and an 8-bit computer."

Cmos allows stored files to remain intact with a very small power source such as a common household battery and a backup nickel cadmium battery. While some portables like Compass use bubble memory — once the rage — Cmos is currently the preferred form of storage.

"The Compass is real expensive, but once bubble memory technology improves, the cost will come down," Levin predicted.

Major Airlines and Their Policies On Portable Computers

- American Airlines** — Allows hand-held computers only, those that typically have a one-line display and very limited capabilities.
- Delta Airlines** — Allows the use of portable computers
- Eastern Airlines** — Prohibits the use of all portable computers.
- Republic Airlines** — Claims to allow portable computers despite warnings in its in-flight magazine against their use.
- TWA** — Allows the use of portable computers.
- United Airlines** — Allows hand-held calculators only.

CW Chart



Convergent Technologies, Inc.'s Workslate

A Hands-On Review of Three Notable Notebooks

By Jim Bartimo
CW Staff

Testing the notion that portable computers can be used by anyone, this writer tried, in the course of writing this Spotlight, the three that are considered the most popular. In fact, this story was written on the Radio Shack TRS-80 Model 100, then transmitted to *Computerworld's* complex of Digital Equipment Corp. PDP-11/70 minicomputers for typesetting.

What follow are personal evaluations of the three portables:

Radio Shack's TRS-80 Model 100

Clearly the hands-down winner with its built-in modem and communications software, the Model 100 transmits at 300 bit/sec with ease and reliability. Software extras include a rudimentary pair of data base management systems for calendar scheduling and note taking.

The word processing program is easy to use, especially since text can be manipulated via a number of clearly labeled function keys.

The major drawback of the Model 100 is its limited memory. By the time you upgrade to 32K bytes of random-access memory (RAM), you will have crossed the \$1,000 dollar purchase mark. However, if you remain with the standard 8K bytes of memory and don't upgrade to at least 24K bytes of RAM, there will only be enough room to store a few pages of text.

NEC PC-8201

This machine could have walked off with first prize if only it had a built-in modem. While the company claims it doesn't want to force you to buy a modem in case you already have one, carrying a full-size modem and/or acoustic coupler defeats the purpose of portability.

This machine is otherwise identi-

'Kneetops' Seen Supplements To Host System

(Continued from Page 11)

mainly for calculations, such as in portfolio analysis.

"The Workslate is aimed at a number of vertical markets," according to Bosomworth. "You can get Convergent to put programs in ROM for you depending on what you want to do with it."

Amidst all that is remarkable about the notebook-size computers is one irony. Although they are the perfect dimensions for the back seat of a jet, at least three major airlines have prohibited their use on-board their flights (see box).

"We had an incident where a portable computer caused interference with the flight controls of the aircraft," a United Airlines spokesman said. "We'll have the results of that incident in 45 days."

Other airlines, such as Eastern Airlines, are waiting for a ruling from the Federal Communications Commission before allowing these lap-size computers near the 32 computers already on-board a 757 jet.

Product Spotlight

cal to the Model 100, but comes with a bevy of programs on tape and burned into read-only memory, the required cables to hook up to a tape cassette and superior cursor-control keys.

Another feature of the PC-8201 is removable, nonvolatile Cmos RAM packs that give added memory — 32K bytes a crack — to virtually eliminate any memory-shortage problems.

Epson America, Inc. HX-20

It's hard to know what Epson was thinking when it brought out this

machine, but perhaps the HX-20's drawbacks can be attributed to its early entry into the market.

The HX-20 has no built-in modem or any communications software as yet, so transmitting to another machine is virtually impossible at this point.

The machine does have a built-in printer and an optional micro cassette drive — perhaps Epson was hoping the HX-20 could be more of a stand-alone device — but alas, with a 3½-in.-wide, 4-line by 20-char. screen, it's too easy to go blurry eyed while writing a program or memos.

The HX-20's virtual screen extends somewhat beyond these dimensions, but to little avail.

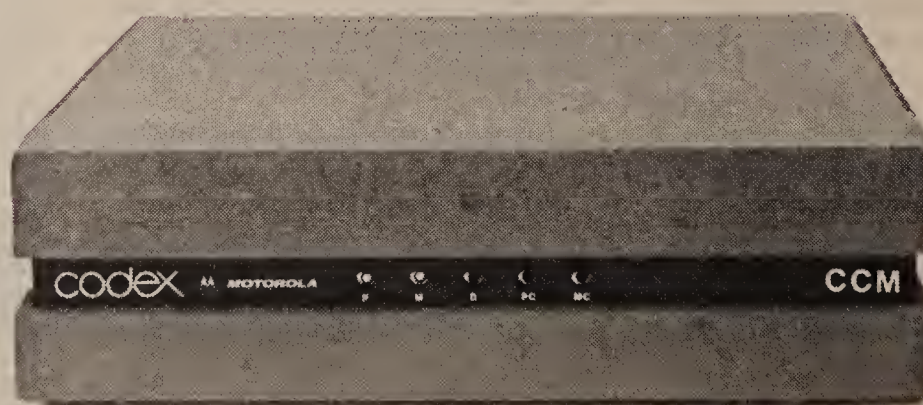
Epson added Skisoft, Inc.'s Skiwriter word processing after the introduction of the machine; this word processing software is perhaps a bit better than its competitors' WP software. Moreover, the Epson keyboard is of higher quality. However, none of this is enough to make up for the HX-20's other deficiencies.

The Epson HX-20 uses Cmos for storage, but, unlike its competition, relies totally on a rechargeable battery for power instead of four AA batteries.

NOTE: Microsoft, Inc.'s version of Basic appears in some form in all three of these notebook computers.

STOP YOUR STRINGING YOU

Lease a Codex Cable Multiplexer
for your IBM 3274 system.
It can link up to 32 terminals
with a single cable.



In High-Volume Environment

Tool Helps Firm Compare DBMS Performance

By Paul Gillin
CW Staff

BOSTON — It is a refrain that is sung all too often: The project looks good on paper, meets all the specifications and is completed on deadline. But once the system starts to handle some volume, response time goes out the window.

The DP department at John Hancock Mutual Life Insurance Co. is determined not to let such chords mar its installation of IBM's IMS data base management system (DBMS). The evaluation and installation of IMS is proceeding with the help of VisiCorp's Visicalc and Crystal, a performance management utility from BGS

Systems, Inc. of Waltham, Mass.

Hancock, which employs multiple IBM 30 series mainframes at its corporate headquarters here, began re-evaluating its DBMS environment early last year. After sifting out proposals from a number of vendors, the choice came down to Cullinet Software, Inc.'s IDMS and IBM's IMS. Crystal was then used to build performance models for the two finalists.

The head-to-head evaluation was targeted at comparing the performance of the products in acquiring data and examining their relative resource consumption in high-volume environments, according to Tom

'The head-to-head evaluation was targeted at comparing the performance of [Cullinet's IDMS and IBM's IMS] in acquiring data and examining their relative resource consumption in high-volume environments. . . . Project members input the path links used by both DBMS and created a transaction-heavy model to run through Crystal.'

Moran, a Hancock consultant. Using information supplied by both ven-

dors, project members input the path links used by both DBMS and created a transaction-heavy model to run through Crystal.

"We got rid of the on-line and application environment and focused on data base access, specifically over a wide number of paths," Moran said. "We used a data base that required 100 [IBM] 3350 spindles. We're talking about an application with 500,000 to 750,000 transactions going against it every day."

The performance model "pointed up some other things that did not appear in the initial study," Moran said. "Using Crystal, we narrowed down [the technical differences] and did a further technical examination."

Although the products performed similarly, IMS proved more efficient at random data acquisition under heavy volume, Moran said. This fact, brought out by the performance model, "made the choice apparent. A lot of issues were raised in the modeling process."

The installation of IMS will continue into 1985, with the design aided by a three-tiered structure using Crystal, Visicalc and IMS "snapshots," which are standard path links used by IMS for various processes. A novel use of the popular Visicalc package allows designers to create module or data path design on the spreadsheet and, thus, bypass the intensive calculations that the process requires.

Gives Design More Depth

"First, the designer can use Visicalc to get a relative idea of the impact of a particular design and then move it to Crystal to give general analytical models compared against other possible designs," Moran said. "Crystal allows you to build a model of your application, which normally would be a tremendous manual effort. It gives your design a little more depth."

The best designs are then compared against IBM snapshots to determine resource requirements.

Crystal also creates a model that can be fed into a model of the DP installation's internal environment created on Best/1, a capacity planning package also from BGS. By running the Crystal model in conjunction with the Best/1 model, the impact of the data base on CPU time can be estimated.

"The productivity benefits are that the designer, in the early days of his design, puts some of his assumptions into the model to see what the benefits are," Moran said. "He does not have to wait until the design is developed and programmed. So it helps a little bit in the quality side."

"It also helps that you don't have to prototype, which on a large project can be quite a savings," he added. "It also can provide a check mechanism of the model against the final result. It gives you some sort of baseline of expectation."

Because installation is still continuing, it is impossible to compare the accuracy of the Crystal model against actual performance, Moran said. However, "we feel rather good about it."

3274 SYSTEM FROM ALONG.

IBM 3274 system users no longer have to pull individual cables each time they add or relocate terminals.

The Codex Cable Mux provides transparent, high speed communications for up to 32 terminals through one single cable. It saves you money and offers unlimited flexibility in setting up terminal clusters throughout your entire organization.

The Codex Cable Mux also offers a variety of purchase and service options no other vendor can match.

Like the opportunity to lease a unit for as little as \$26 a month.

And a choice of on-site or back-to-the-factory maintenance.

For more information about Codex's Cable Mux, call 1-800-821-7700 ext 888. Or write: Codex Corporation, Dept. 707-88, 20 Cabot Blvd. Mansfield, MA 02048.

Codex

 MOTOROLA INC.
Information Systems Group

SEC Plans Electronic Filing of Disclosure Forms

By Peter Bartolik
CW Staff

WASHINGTON, D.C. — Those who like to play the stock market may be able in the not-so-distant future to analyze opportunities and immediately execute confirmed buy and sell orders from their homes.

The Securities and Exchange Commission (SEC) announced recently that it has contracted for a study to establish a pilot project for the electronic filing of disclosure forms by reporting companies, as well as for instant dial-up access to the accumulated data by the investing public.

Some 9,500 publicly held companies file more than 175 types of forms with SEC, ranging from stock prospectuses to annual reports and tender offers. SEC would like to reduce this mound of paperwork.

According to an SEC spokesman, reporting companies generally have their disclosure reports printed and delivered to SEC headquarters here. The reports are then distributed to staff offices responsible for review, copied onto microfiche and then made available to the public through SEC's public reference rooms. "Summaries of some of the information in these reports are eventually distributed by private firms through computerized data banks, but the

lag time can be three months or more," the spokesman said.

Commission Chairman John S. R. Shad wants to establish a means for reporting companies to file their reports electronically. He sees that development speeding up the public's access to the data provided by companies.

Mitre Corp. has been contracted by SEC to examine the information to be pro-

cessed, evaluate available technology — including security — and costs and advantages and disadvantages of various system approaches. A pilot program involving an as yet undetermined number of companies will begin some time next year and will be tested and debugged for at least one year, the spokesman said.

Whereas typical investors now must wait while finan-

cial analysts digest and regurgitate the many filings, SEC foresees home computers and data bases in the future providing instant analysis in the home and the office. By the time the system is completed, the spokesman said, "It is expected that investors will be able to enter their market orders directly and receive instant execution confirmations on their own computer terminals. They

will also be able to retain their complete portfolios in their data banks and instantly price them to the market."

Through links to software systems, analysts and investors should be able to display all listed stocks that closed the previous day, with crucial factors and ratios such as stock prices above or below six times earnings, four times cash flow, 75% of book values per share and so forth.

Northwest Bell Cited by FCC For Violation

WASHINGTON, D.C. — Northwestern Bell Telephone Co. was fined \$80,000 last week by the Federal Communications Commission (FCC) for violating the commission's Second Computer Inquiry decision, which says that AT&T and its operating companies must market terminal equipment through separate subsidiaries.

Northwestern Bell transferred ownership of its installed terminal base last June to AT&T Information Systems, the separate subsidiary established by AT&T, to comply with the FCC order. However, it continued to provide maintenance and other support to the users, which the FCC said violated Computer Decision II.

Virtually all of Northwestern Bell's terminal support activities have now been transferred to AT&T Information Systems, and the remainder soon will be, according to an FCC spokesman. He added that he expects Northwestern Bell to appeal the fine.

WHY YOU SHOULD RECOMMEND A KAYPRO EVEN IF YOU DIDN'T BUY ONE YOURSELF

If you're happy with the computer you now own, we're happy for you. Because we both know what you went through to buy it.

More than likely, it was a long year's education that sent you into a complex maze of trial and error. You spent a lot of time asking questions in computer stores. More time hunting for answers in computer books. Even more time investigating all the hardware, let alone software options you had to consider.

It was a hard way to get what you needed. A year that earned you an honorary degree in computer engineering and the status of a computer buff.

But just between us buffs, would you recommend a year like that to a friend?

FOR THE FIRST-TIME BUYER, KAYPRO IS A GODSEND.

We think the 'hard way' is the wrong way to have to buy a computer. After all, a business person shouldn't be required to make de-

cisions better left to an engineer.

Trying to find compatible interfaces and software packages alone would drive most people up the wall (remember?).

So, we've taken a different



approach to making and selling our Kaypro II. Rather than a starter system, with options you buy piece for piece, it's designed with all the integrated hardware and software it needs to be fully functional.

Off the shelf, Kaypro II is completely ready for business. We think that's what the first-time buyer really needs.

IT'S A COMPLETELY INTEGRATED SYSTEM.

Since we don't consider a monitor, disk drives, interfaces or

other hardware as optional extras, all Kaypro's hardware comes complete in an integrated system. Except, of course, for a printer. As you know, some people don't need one. And those who do must decide whether they need dot matrix or letter quality printing.

What's complete on a Kaypro II?

64K RAM, Z-80 microprocessor. A 9" green screen monitor. Dual disk drives, the same used by IBM. A detachable keyboard that's more complete than you'll find on the latest Apple. Built-in interfaces for both a printer and communications.

In other words, all the hardware you'd recommend to a first-time buyer. In one complete package.

IT COMES COMPLETE WITH SOFTWARE.

While businesses can be very different, the fact is that 95% of all business needs can be fulfilled by a series of three business applications programs. Word Processing/Spelling, Data Base Management and Financial Spreadsheets.

It's the software that's optional with other computers.

Registered Trademarks: Apple — Apple Computer, Inc., IBM — IBM Corp., CP/M — Digital Research, Inc., Z-80 — Zilog, M-Basic — Microsoft, Inc., Tandy, TRS-80 — Tandy Corporation, Osborne — Osborne Computer Corporation, Xerox — Xerox Corporation. Prices based on published information as of July 15, 1983. © 1983 Kaypro Corporation.

Felony Charges Filed Against Alleged Hacker

By Katherine Hafner
CW Staff

LOS ANGELES — Ronald Mark Austin, arrested earlier this month, has been charged with a series of penetrations at computer sites around the world that left a path of altered records, stolen CPU cycles and general resolve among victims of the break-ins to revamp their password systems.

The 19-year-old Universi-

ty of California at Los Angeles (UCLA) sophomore allegedly used the U.S. Department of Defense's Advanced Research Projects Agency Network (Arpanet) to gain access to 200 accounts at 14 separate sites, including Rand Corp. in Santa Monica, Calif., and Cornell University in Ithaca, N.Y.

A concurrent investigation by the Federal Bureau of Investigation has also linked

Austin to a string of break-ins at Stanford University in Palo Alto, Calif.

"It's our belief it will cost all these different agencies and institutions hundreds of thousands of dollars to reprogram their systems in order to prevent this from recurring," commented Al Albergate, press secretary in the Los Angeles County district attorney's office, which arrested Austin.

All of the companies and schools allegedly tapped by Austin participate in Arpanet, Defense's packet-switched network for the research community. Although classified data has been transmitted over Arpanet, "the data is encrypted and cannot be accessed by anyone but the intended receiver," a Defense spokeswoman maintained.

"We can say that the au-

thorized accesses were known to the department at the time they were occurring and were recognized as unauthorized attempts to obtain data, but no information damaging to the national security was obtained," the Defense spokeswoman said.

Relay Point

Paul Weeks, a public information officer at Rand, said, "On Aug. 29, an unauthorized user got into a Rand computer, then used the Rand system as a relay point to hop to another system on Arpanet. But no information was destroyed."

"I can't say Austin is the one who broke in here," Dean Krafft of Cornell's computer science department said.

"But it appears someone did log on to at least five of our accounts. As far as we can tell, no damage was done to our system. No records were altered. Maybe CPU cycles were stolen, but that's all we know," according to Krafft.

Krafft said that Cornell is taking measures to improve the university's password system.

Inactive Account

According to Tom Tugend of UCLA's engineering and physical sciences department, Austin was pinned down when another UCLA student was working late one night and noticed that someone was logged on to a University of California at Berkeley account that he knew had been inactive for a long time.

"His suspicion was aroused. He told people in the computer lab, and the [district attorney's] office was notified," Tugend said. The district attorney's office began monitoring late-night activities on the UCLA computer system.

According to Albergate, Austin habitually gained access to UCLA accounts and "chatted" with two others: Kevin Poulsen of North Hollywood, Calif., and another person, who is identified only as Kareem.

Poulsen is under investigation, and Kareem has yet to be tracked down, Albergate said.

Authorities confiscated Austin's personal computer at his Santa Monica home on Sept. 22, along with a black-and-white television set he used for a screen. Austin was arrested Nov. 2 and awaits a Dec. 2 preliminary hearing. He is charged by the district attorney's office with 14 counts of maliciously accessing a computer system, which carries a maximum sentence of six years.

But it too comes complete with a Kaypro.

And with its CP/M operating system, Kaypro II is capable of running thousands of other business programs, to fill more specialized needs.

IT SELLS FOR \$1595, COMPLETE.

People are bound to ask you how much they should spend on a computer. There is, of course, an obvious answer: as little as possible and still get a serious business system, complete with all the functions they need.

At \$1595, Kaypro II is the least expensive serious business system we know of on the market today.

There are basic starter systems advertised for less. But their optional hardware and software can double or triple their basic price. So they can end up costing \$2000-\$3000 more than a Kaypro.

A good example is an Apple IIe. With a hardware configuration comparable to Kaypro II's, complete with comparable software, it lists for an average price of \$4400. \$2805 more than a Kaypro.

IT OFFERS MORE MEMORY FOR THE MONEY.

Since disk drive memory capacity is always a concern, once again the idea is to get the most for the money. With two disk drives, Kaypro II gives you 400K for \$1595. With equivalent hardware, an IBM gives you 320K for about \$2800. And Apple IIe gives you 286K for about \$2400.

So once again, Kaypro II delivers.

IT HAS POWER TO SPARE FOR WHAT MOST BUSINESSES NEED.

The more you love computers, the more tempting it is to recommend a 16-bit vs. 8-bit

machine. You know that 16-bit systems are a little faster and have more power to run longer programs.

However, 16-bitters are far more expensive than the 8-bit variety. And, unfortunately, have only a handful of business applications software packages that really take advantage of them.

SPECIFICATIONS

Microprocessor	Perfect Filer
Z-80	Perfect Calc
Operating System	spreadsheet
CP/M 2.2	Wordstar word processing
User Memory	The Word Plus
64K	Profit Plan
Disk Drives:	spreadsheet
2 drives, 400K, unformatted	M-Basic
Interfaces	12 Games
1 Serial	Uniform—allows computer to
1 Parallel	'read' and 'write'
Keyboard	TRS-80, Osborne, Xerox disks
Detached, 63-key with numeric keypad	Dimensions
Software included:	Height: 8 inches
Perfect Writer	Width: 18 inches
word processing	Depth: 15½ inches
Perfect Speller	Weight: 26 lbs. (portable)

Considering the real needs and budget limitations of most small businesses, why suggest a company limo when a good company car will do?

Since 75% of all micros sold today are 8-bit systems, it's indicative of their capacity to take care of business. We'd stick with a Kaypro II.

IT CAN PAY FOR ITSELF FASTER THAN MORE EXPENSIVE COMPUTERS.

Every business person wants a computer to pay for itself in increased productivity.

And the faster the better. Perhaps on this count alone, Kaypro II is worth recommending.

As a fully functional business system for \$1595, Kaypro can win the payout race hands down.

IT'S BECOME A LEADING SELLER THANKS TO COMPUTER BUFFS, LIKE YOU.

In fact, Kaypro II is one of the best sellers in the \$1000-\$5000 price range. And it got there largely because of the enthusiastic word of mouth, and word of press, of computer enthusiasts. Many of whom, after building their own systems, bought a Kaypro II as their second computer.

So you certainly won't be alone if you recommend Kaypro II to anyone shopping for a first computer.

Or look at it this way. Once you tell people about the complete business computer for \$1595, they'll probably stop bugging you with a lot of questions.

They may even forget to ask why you didn't buy a Kaypro II for yourself.

Just between us buffs, we can't recommend a good answer for that.

CALL 800-447-4700 FOR THE DEALER NEAREST YOU.



Japan Readies Backbone Cable for ISDN

By Phil Hirsch

CW Washington Bureau

GENEVA, Switzerland — The first section of a 400M bit/sec fiber-optic transmission cable that runs down the center of the Japanese archipelago is scheduled to go into service next month. The cable will be the backbone of a new integrated services digital network (ISDN) that is intended to support the "advanced information society" being created by Japan's increasing use of computers and computerized information.

The quote comes from a paper presented here recently at Telecom '83, a worldwide telecommunications conference. The author is Yasusada Kitihara, executive vice-president of Nippon Telephone and Telegraph

Co. (NTT), Japan's domestic telecommunications carrier.

Kitihara's paper, along with those of the other NTT officials who spoke at Telecom '83, provided a detailed picture of how Japan is preparing for the "advanced information society."

Although integration of presently separate data, voice, image and record services is one way of lowering the cost of those services and thus extending their reach, it is not enough, according to Kitihara. Since 1977, he has been advocating a new scheme of charging for communications services based on the number of information bits transmitted rather than on the time of day or distance traversed.

At Telecom '83, Kitihara said that

the new charging scheme will be a key element of Japan's new ISDN, which is known officially as the Information Network System (INS). Another key element will be "a new-generation computer" — one having "pattern recognition, voice synthesis, natural language processing and intelligent processing capabilities. Through the development of such computers we will . . . be able to provide automatic translation service, making it possible for future generations to communicate worldwide in their mother tongues."

However, it will take more than 10 years to develop the new computer, Kitihara said.

In 1985, he added, Japan expects to begin providing voice/data services

through common, computer-controlled switching equipment. These facilities, along with digital local loops and digital intercity transmission links, will provide the hardware needed to build the commercial INS network.

"In September of last year, we started building a model INS system in the Musashino and Mitaka area, a Tokyo suburb," he reported. This system, which will serve some 10,000 subscribers, is to be tested for about five years; during that time, it will offer a variety of interactive services including Captain, Japan's advanced videotex system.

Commercial INS service is scheduled to begin in 1985, said Kitihara, and be available a year later in 10 major cities. By 1987, the company intends to have Japan's 60 largest cities interconnected.

The APPGEN™ Applications Generator Can Save You More Than You Might Imagine.



Imagine Time and Money.

If you develop or modify commercial software systems, the APPGEN Applications Generator Environment can increase your efficiency by a factor of 10 to 50 times.

APPGEN Is . . .

An interactive, menu-driven, fourth generation language Computer-Aided Applications Generator Environment. It allows you to implement complex, *transaction driven, integrated* commercial applications with virtually a limitless number of files, screens, menus and reports.

It uses a non-procedural English language approach that does not require you to learn a new language. Because the system is developed through parameter tables, the applications work exactly the way they were designed. *No program debugging is required.*

APPGEN Is Not . . .

Simply a Data Base Management System, Screen Generator, or Report Generator (although each of these functions comprise a subset of the

APPGEN capability). What separates APPGEN from Program Generators is the fact that it produces *no code* to integrate and debug.

Automatic System And User Documentation

APPGEN does not stop with the implementation of a running system. It also automatically produces system and user-level documentation. The user documentation is also automatically available as an on-line help function for every APPGEN-created system.

Very simply, when it comes to saving you time and money, the APPGEN Applications Generator is number one.

Imagine settling for less.

*APPGEN is a trademark of The Software Express, Inc.



THE SOFTWARE EXPRESS, INC.
10103 Fondren, Suite 220
Houston, Texas 77096
713-270-5218
800-231-0062

Our Name Is Our Business.

**Come See Us At Our Booth In The Sahara #9713 Or See A Demo
Of APPGEN At Your Favorite Manufacturer's Booth.**

Wideband Loops Called Significant

GENEVA, Switzerland — Wideband local loops will be the most significant part of Japan's Information Network System (INS), according to one of several papers presented by representatives of Nippon Telephone and Telegraph Co. (NTT) at the recent Telecom '83 here.

Only by putting high-bit rate transmission capacity on the user's doorstep can the full potential of the new network be realized, explained NTT engineers Nobuo Inoue and Kimio Tazake in a paper titled "Steps to Enhance Telecommunications Networks Toward [an] Advanced Information Society."

Initially, subscribers will access INS through existing local loops, which, modified by black boxes at either end of the circuit, will be able to transmit digital information either simultaneously or alternately with analog voice signals. In the latter mode, two digital channels will be provided — one operating at 64K bit/sec, the other at 16K bit/sec — along with two 4K bit/sec channels for customer-network control signals.

In the "simultaneous" mode, digital data will be transmitted in a frequency band above the one used for analog voice, thus permitting both to operate at the same time.

The use of this "hybrid access" system reportedly will allow digital data to be transmitted at up to 16K bit/sec and possibly as high as 24K bit/sec.

Most of Japan's in-place local loops use paper insulation and will permit a digital signal to be transmitted only about three kilometers. In 1981, however, NTT began installing plastic-insulated loops, which reportedly extend the transmission distance to seven kilometers and enable the company to reach "virtually all" of its subscribers, the authors said.

"Optical-fiber systems will be the main vehicle for modernizing the local network," they added. The system Japan is planning will be able to carry analog and digital video, analog and digital voice and high- and low-speed data.

Lonely Misfits or Budding Criminals?

Hacker Debate Continues at Security Conference

By David Myers

CW New York Bureau

NEW YORK — Conservative and liberal squared off in a dispute over hackers at the 10th Computer Security Conference here last week.

Seymour Papert, professor of mathematics and education at MIT and the inventor of the educational software language called Logo, defined hackers as social misfits who need to be given an opportunity to communicate their computer skills.

Donn B. Parker, senior management systems consultant at SRI International, countered that hackers are criminals — shoplifters, spies, even terrorists — who should be punished.

"I'm afraid some of them don't really understand that they are in violation of the law. When they see their fellow hackers are in fact going to juvenile hall for six months, maybe they'll wise up," Parker said.

Parker said hackers may start off as pranksters. He compared them to himself as a boy and to his young friends.

"We would tear down an abandoned barn for the sheer joy of being

destructive. But we knew we were breaking the law. I'm not sure hackers understand that," he said.

Prof. Papert, however, characterized hackers as skilled computer users who "manipulate the machine the way they are unable to manipulate people."

Hackers tend to be isolated and to work alone, Papert said. Hacking is often their only means of interacting with others, he pointed out.

The irony is that computers are designed to be linked together and the computer not part of a larger enterprise is "the extreme case," not the norm, Papert said. In their hacking, young computer whizzes betray

their desire to belong, he noted.

Parker inadvertently supported Papert in this when he quoted a message left on an electronic bulletin board for computer pirates: "The few people we can communicate with are our fellow hackers," someone had written.

But in general Parker took a harder view of the menace from hackers, saying that "when unauthorized people gain access" to a computer system, "the losses can be serious and they can be large."

The losses include destroyed software programs, tied-up access services, disclosure or theft of data, (Continued on Page 18)

IBM's Security Outlined at Meet

NEW YORK — Computer users and security specialists who attended the 10th Computer Security Conference here last week were treated to an inside view of IBM's security arrangements.

Dominic Stavola, senior security administrator at IBM, told an audience at the New York Penta Hotel that "setting up data security requirements must start at the very top of an organization and come down from there. It helps to get the chairman of the board involved if you can."

Stavola also warned against the "arbitrary split" between physical-plant security and information protection and said a firm's computer center is "the wrong place" to locate responsibility for systems security.

"Typically, the computation center is not high enough up in an organization to provide executive-level protection," Stavola said.

What is more, since data processed in the DP department is available "outside the confines of the computer room," data protection ought to be centered somewhere outside the room, too, according to the IBM security chief.

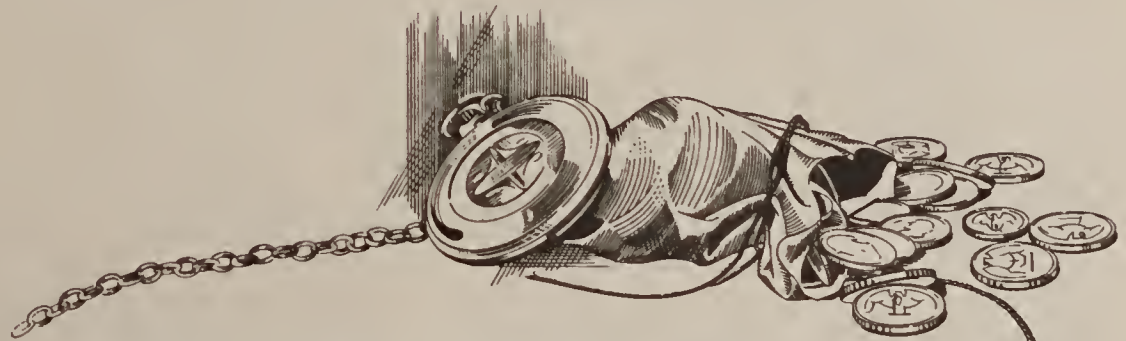
Stavola urged appointment of a "staff catalyst" to put security plans into motion. Though the "staff catalyst" should not double as director of management information services for the firm, he should still "be intimately aware" of computer technology so he can recommend enhancements to the system where necessary, Stavola said.

Other suggestions Stavola made included assigning ownership of every bit of information to someone within the organization and giving every bit of information a dollar-and-cents value.

"It's a mistake to treat all information as if it had the same value, rather than selectively applying protection to data based on its worth to the organization," Stavola said.

Asked how to go about convincing management of the need for data security measures, Stavola replied, "The only way I know for sure is to have a major incident. They don't appreciate the value of the information they have until someone misuses it."

The APPGEN™-Based Application Packages Save You Time And Make You Money.



More Than You Can Imagine.

We've Developed A New Applications Generation.

The best way to prove an Applications Generator is to produce and install sophisticated systems with the product. We've done just that. The Software Express currently offers 10 integrated accounting packages for your use—all implemented under APPGEN. They include:

- General Ledger
- Accounts Payable
- Payroll
- Accounts Receivable
- Inventory Control
- Order Entry
- Client Write-Up
- Job Cost
- Professional Time Reporting
- Fixed Assets

You Don't Have To Start From Scratch.

We've developed APPGEN Application Packages for large company functionality and flexibility. These applications provide the reseller five significant advantages:

1. Applications that are more functionally complete.
2. The Applications can be tailored to the user so a broader range of clients can be installed.
3. The reseller does not pay extra for greater functionality.
4. Reseller's margins are excellent.
5. If an Application must be modified, APPGEN makes the change 20 times faster.

The Software Express offers the largest body of 4th Generation applications software

available from a single source. The APPGEN environment is available for all systems which operate the UNIX™ or PICK™ operating systems.

Now you don't have to imagine saving time and money. It's a reality with APPGEN-Based Application Packages.

*PICK is a trademark of PICK Systems Inc.

*UNIX is a trademark of Bell Laboratories

*APPGEN is a trademark of The Software Express, Inc.

APPGEN Saves You Time And Money. To find out more, send this coupon today.

- ☐ Please send me more information on APPGEN.
 - ☐ Please send me more information on Application Packages.
 - ☐ Please send an Executive Demo Videotape on APPGEN @ \$45.00 per tape plus shipping.
 - ☐ Please send an Executive Demo Videotape on Applications @ \$45.00 per tape plus shipping.
- For video specify: ☐ VHS ☐ Beta
☐ Send C.O.D. ☐ Check enclosed

Name _____

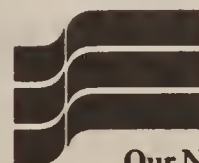
Company _____

Address _____

City _____ State _____ Zip _____ Tel _____

Authorizing Signature (C.O.D. Orders) _____

CW111483



THE SOFTWARE EXPRESS, INC.
 10103 Fondren, Suite 220
 Houston, Texas 77096
 713-270-5218
 800-231-0062

Our Name Is Our Business.

Come See Us At Our Booth In The Sahara #9713 Or See A Demo Of APPGEN At Your Favorite Manufacturer's Booth.

Computer Law Forum Addresses Software Piracy

By David Myers
CW New York Bureau

NEW YORK — Although legal experts are unanimous in agreeing that the U.S. Congress intended software to be protected by its Copyright Act of 1974, the problems of protecting software from pirates did not end with that act, lawyers attending the Computer Law Institute here recently were told.

Copyright lawyers and computer law experts addressing the three-day conference all said that U.S. law protects software programs from unauthorized copying and use. But they did not agree on the ramifications.

"All right, software is copyrightable. But how valuable is the copyright for protecting it?" asked Jon A.

Baumgarten, an attorney with the firm of Paskus, Gordon and Hyman, in Washington, D.C. Baumgarten suggested that copyrights held by large vendors may raise antitrust questions.

For users, even the lowliest diskette is covered by a copyright, even if it carries no encircled C symbol, and companies that copy the diskette's programs without permission are breaking the law, noted Daniel T. Brooks, staff attorney with Computer Law Advisers in Springfield, Va. But memory chips and operating systems do not seem to be protected by copyright, Brooks told the conference attendees, of whom about 80% were lawyers representing vendors and around 20% were lawyers represent-

ing users.

Software is eligible for copyright protection in the first place because it is intended to communicate something. "Other programmers can, in fact, read what you have done," Brooks explained.

Michael S. Keplinger, a division chief in the U.S. Copyright Office, explained that a piece of work is thought to communicate something when it is "fixed in a form in which another human being can perceive it."

Under this definition, the fact that software programs can be reproduced is what brings them under the scope of the copyright laws, according to Keplinger. But he went on to warn that requirements for copy-

right protection differ depending on whether the software is licensed, distributed or sold over the counter.

An operating system, however, has been interpreted by the U.S. District Court as "enabling machines to work in tandem" and not communicating anything, Brooks pointed out. Therefore, it is not currently shielded by copyright law.

While the Copyright Office has taken the position that memory chips are "useful objects" and not eligible for copyright, it has also gone on record as saying that the drawings of the circuits burnt onto the chip, and even the chip masks, are indeed "original works" and can be copyrighted. But Baumgarten warned that recent court decisions suggested that copyright protection of a circuit layout "does not necessarily provide you with protection of the circuit's function."

Hacker Debate Still Brewing

(Continued from Page 17)

wholesale changes in stored information and time spent chasing down the intruders and locking them out, Parker said.

As for a cure to hacking, Professor Papert urged adoption of the goal of a computer for every child.

In a classroom full of computers, the hacker — a young expert — is solicited by the other children for help with their problems, Papert pointed out. Getting computers into the hands of his contemporaries will make the hacker feel wanted, he suggested.

"We now have in this country one computer for every 150 children. That's not enough to make a difference in anyone's life. To be competitive in the 21st century, we can't afford not to do this. But that's only the economic side. We can't afford it morally either," Papert said, warning that an uneven distribution of computers could divide the U.S. into classes of haves and have-nots.

'Change Their Values'

Parker agreed that "somehow we have to change the values of these kids" and "turn valuable kids around." But for the most part his solutions to the hacking problem were more straightforward.

Cut down the number of prompts that a caller into a dial-up access system receives on his screen, he urged. Investigate automatic dial-back devices for use with preauthorized telephone numbers, he added.

"You may want to design a trap in your system to lure [the hacker] into an attractive but limited area and keep him on-line long enough for the authorities to find out who he is," Parker said. He also recommended that DP managers know the names of their police department and FBI contacts in the event of a system break-in.

One solution Parker said he does not favor is hiring the successful hackers. "We have to let them know they are not heroes. Anyone who hires a malicious hacker deserves anything that happens to him."

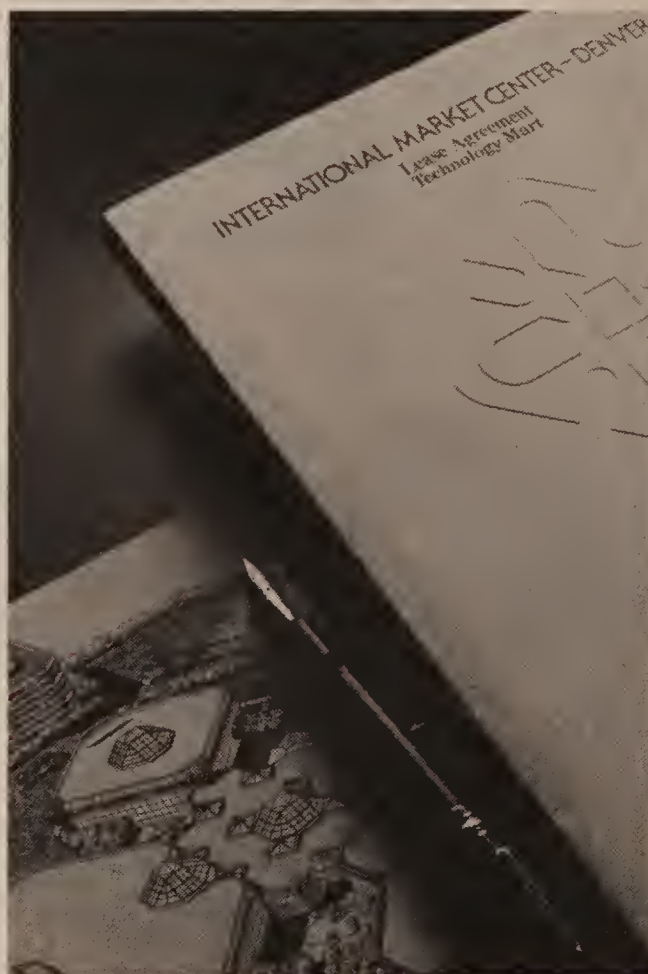


An average sales call costs \$300.

You've watched it happen for a long time. Identifying your prospect, getting to him and finally selling him is getting more costly and less efficient.

The Technology Mart at Denver's new International Market Center offers you a profitable alternative to the old, exhausting process. As part of a state-of-the-art exhibit, educational and executive conference facility, the Mart will offer programs designed to attract qualified buyers. It's the one alternative that can lower both your cost per sale and your blood pressure, while supporting existing channels of distribution.

Most importantly, the new mart



Now you can beat the averages.

is strategically located in the heart of a burgeoning 11-state region that stretches from Mexico to Canada. It's a region with a proven growth rate in the consumption of technology products and services. The International Market Center Technology Mart offers an affordable, efficient way to penetrate this deep buyer base.

Leasing rates are most attractive now for late fall 1985 occupancy. To find out how your company can beat the averages, contact Bob Okonski, Vice President Technology Mart, International Market Center—Denver, 7951 East Maplewood Avenue, Suite 300, Englewood, Colorado 80111 (303) 694-1966.



INTERNATIONAL MARKET CENTER In Denver
Incomparable. World Class. At last.

A development of The Bill L. Walters Companies



SYNAPSE
TRANSACTION
PROCESSING.
SYSTEM
OVERVIEW.

GET THE WORD ABOUT TRANSACTION PROCESSING. IT'S IN THE BOOK.

In our free 82-page book, "SYNAPSE TRANSACTION PROCESSING. SYSTEM OVERVIEW." And it's a revelation. To non-technical management, technical management, and staff alike.

It spells out how to accelerate development and minimize maintenance of high-performance, fault-tolerant, online transaction-processing systems.

It also discusses miracles: how to get dazzling performance from a Relational

DBMS and how to expand a transaction-processing system online under power.

It reveals how to provide fault tolerance without redundant hardware and without programming. How to use a system-wide dictionary to standardize and control all definitions and relationships. How to completely automate database integrity, concurrency and recovery.

It's all there. Chapter and verse. Even a comprehensive index. To get your copy,

simply mail the coupon or give us a call at (408) 946-3191. And let **Synapse** there be enlightenment. Computer Corporation

THINK AHEAD.

To: Synapse Computer Corporation,
Corporate Communications Department C2,
801 Buckeye Court, Milpitas, CA 95035.

Please send me your free, 82-page bible on transaction processing.


Name Phone

Title Company

Address

City State Zip

© 1983 Synapse Computer Corporation.



466 ways to use an HP 3000.

The point of buying a computer is to speed things up. So why let programming slow you down?

With the HP 3000 family of business systems, you can usually be up and running as soon as you plug them in. Because our computers come with a vast range of ready-to-use software that covers the applications spectrum from accounts payable to zoning.

We wrote many of these special programs ourselves. Last year alone, we supplied customers with more than \$50 million worth of applications software. Others come from a variety of software firms working closely with us.

So the chances are pretty good that your own programming effort can be trimmed substantially. When you do need to write your own programs, the HP 3000 will help you do it much faster. With our special set of programming tools, customers have cut 500 lines of code down to 100. At about \$50 a line, that really adds up.

Here's another way you save. With complete compatibility across the entire range of HP 3000s, you don't have to spend a dime converting software from one system to run on another. That's a big help when you're picking the right computer for a branch office or a regional center. Or any size office in-between.



Press here.

When you write a program for our inexpensive Series 39, you can also use it on our Series 68 distributed mainframe which handles up to 400 users. Or on our mid-range Series 42 and 48 computers.

Here's some more help in making your selection. The HP 3000 costs up to 40% less than comparable systems. So you save on the hardware as well as the software.

If you'd like to see how useful an HP 3000 can be, call your nearest HP sales office listed in the white pages. Ask a Business Computer Specialist for a demonstration. Or write for more

information to Tom Rappath, Hewlett-Packard, Dept. 03184, 19447 Pruneridge Avenue, Cupertino, CA 95014. In Europe, write to Henk van Lammeren, Hewlett-Packard Nederland B.V., Dept. 03184, P.O. Box 529, 1180 AM, Amstelveen, The Netherlands.



**HEWLETT
PACKARD**

Managers on the Move

ALAN G. MERRITT has joined National Gypsum Co. in Dallas to fill the newly created position of general director of information systems. He will be responsible for the development and implementation of the long-range architecture for information systems facilities as well as the management of specific related functions.

Merritt was employed by IBM for the last 15 years, pro-

gressing through sales, staff and management positions. Prior to joining IBM, Merritt was with Pacific Telephone Co.

Merritt is a graduate of the University of California at Berkeley, where he received a bachelor's degree in economics in 1964.

JOHN W. DOWNING has been named vice-president of management information

services for Southern Pacific Co. in San Francisco.

Prior to his promotion, Downing served as senior assistant general manager of management services for Southern Pacific Transportation Co. He joined the company in 1951 and during the next nine years held various positions in the general auditor's office.

In 1961, Downing was named a systems associate in

the systems research office and later was a supervisor and assistant manager. Five years later, he was made assistant manager of the Total Operations Processing System, Southern Pacific's computer system, which became operational in 1968.

Downing was named manager of systems research in 1967 and was appointed senior assistant general manager of management services

in 1982.

He attended City College of San Francisco and the University of San Francisco.

ELLEN L. BURNETT has been promoted to corporate data base coordinator for McCormick & Co., Inc. in Hunt Valley, Md., where she will be responsible for data base administration involving the audit, review, analysis and coordination of data on the corporate product and component data base.

Burnett previously held positions in production control, the spice mills and the payroll department for the former McCormick division (now known as the Grocery Product Division). She joined the Corporate Specifications Department in September 1980.

Burnett attended both Essex Community College and Dundalk Community College in Baltimore County.

Seminar Series Treats Software

COLUMBIA, Md. — McCabe & Associates has announced a schedule of its remaining software engineering methodology seminars for 1984.

"Structured Analysis and Design" will be offered Dec. 13-15 in Washington, D.C. "Structured Testing" will take place Dec. 5-7 in New York. "Software Quality Assurance" will be offered Jan. 10-12 in Washington, D.C., and "Project Management" will take place Dec. 6-8 in San Francisco and Jan. 18-20 in Washington, D.C.

Registration prices are \$650 prepaid or \$725 if billed after the conference.

More information is available from McCabe & Associates, Suite 111, Twin Knolls Professional Park, 5501 Twin Knolls Road, Columbia, Md. 21045.

NCR Users Meet Set for Sept. 12

ATLANTIC CITY, N.J. — The second annual conference of the NCR Corp. East Central Users Organization (ECUO) will be held at Bally's Park Place here Sept. 12-14, 1984.

Atlantic City was also the site for the first conference held by the fledgling group this past October.

Literature on the conference will be mailed out prior to next April, according to a users group spokesman.

Information on attending the conference and vendor exhibition provisions are available from NCR ECUO, which can be reached through P.O. Box 7, Dresher, Pa. 19025.

TEK GRAPHICS DESKTOP
PRODUCTS

THE GRAPHICS
STANDARD

Powerful text editing. High-speed graphics. Color copies. The new desktop family from Tek!

VT100 text editing and PLOT 10 color graphics are now packaged as basic desktop units and priced from \$3995* complete.

Tek's new 4100 Series desktop terminals answer a range of resolution, screen size, color palette and local intelligence needs.

All three feature 60 Hz non-interlaced displays; rapid 16-bit graphic processing speeds; 38.4K baud communications; easy color selection from the keyboard; 4096 x 4096 addressable display space; compatibility with ANSI X3.64 screen editors; and an unconditional one-year on-site warranty with low-cost extended coverage.

For less than \$1600, you can plug in Tek's compact 4695 Color Graphics Copier. The 4695 uses a palette of 125 shades to produce report-size paper or film copies of on-screen displays at the push of a button.



Tek's new 4170 Local Graphics Processing Unit helps you conserve host power while you build on a central data base. The 4170 provides up to 886K RAM for CP/M-86-based standalone programming and pre- or post-processing on any

4100 Series terminal.

Factor in compatibility with Tek PLOT 10 software and 4110 Series terminals, and you'll discover the first desktop graphics you can't outgrow.

For literature and the address and phone number of your nearest

Tek sales office, call:

1-800-547-1512.

Oregon only, call 1-800-452-1877.

*All prices quoted are U.S. Domestic

VT100 is a registered trademark of Digital Equipment Corporation. CP/M-86 is a registered trademark of Digital Research, Inc.

Designs and hard copy courtesy of ISSCO, SASGRAPH™, SAS Institute Inc., Swanson Analysis Systems, Inc. and GDS Applied Research of Cambridge.

Tektronix
COMMITTED TO EXCELLENCE

Consider Maintenance, Tests, Timetables More Seen to Contracts Than Price, Delivery

By David Myers

CW New York Bureau

NEW YORK — In negotiating contracts with vendors for large-scale purchases of computer systems, users should pay as much attention to maintenance clauses, acceptance tests and project timetables as they do to price and delivery.

That is what computer law experts told staff attorneys from both vendor and user companies who attended the Computer Law Institute here recently, a continuing education seminar offered by the Practising Law Institute.

"Organizations focus too exclusively on delivery, on that point in time at which the machinery is delivered. There are other considerations that are just as important," said Richard L. Bernacchi, a lawyer with the Los Angeles firm of Irell and Manella.

Focusing on the equipment's price to the exclusion of its maintenance costs is dangerously shortsighted especially when upkeep averages between 10% and 15% of a system's bill each year, according to Charles E. Harris, a Florida attorney and editor of the computer law newsletter "CNReport."

Consider Maintenance Early

Maintenance needs in particular must be considered from the very beginning of contract negotiations, Harris said.

"If you wait, you will run into the vendor's 'Oh, by the way' attitude. 'Oh, by the way, now that we have a contract, we need a maintenance agreement — here it is.' At that point, you face, to put it mildly, very reduced negotiating leverage. The salesman has his commission, the vendor has the contract, and if you don't like the maintenance that is proposed, fine, you provide it," Harris said.

Users shopping for a new system must pay as much attention to maintenance provisions as to performance characteristics in judging a vendor's goods, Harris added.

Bernacchi urged users to negotiate long-term maintenance agreements. "More and more vendors are terminating maintenance, especially on operating software, if there's a clause permitting them to do so," he pointed out.

If a vendor is unwilling to commit himself to long-term maintenance on his product, "you'll find out why," Bernacchi warned. Usually it means the vendor is on the edge of developing something newer and more competitive but doesn't want to tip off the unwary user, he said.

In judging the results of a system's acceptance tests, pay as close attention to reliability as to sheer performance, Harris cautioned.

"Focus on both the frequency of down-time problems and their duration. They may last just a few minutes but occur quite often," he pointed out.

Both Harris and Bernacchi warned against leaning too heavily on the results of benchmark tests.

"Benchmark tests can be remarkably good marketing ploys and re-

markably poor performance gauges if compatibility is not taken into account," Harris said.

Other things to think about in a major systems purchase, Bernacchi said, are:

- Whether the system is being chosen because it is cheap or because it consists of what the corporate organization needs.

- Whether it can provide the business results desired, not in terms of "bits and bytes and the other gobbledygook you see floating around the industry," but in terms the executives "who are going to have to live with it" can understand.

- Whether the system can be up

and running and starting to accomplish those results when management needs them.

- And whether the system, from acceptance testing to annual maintenance, fits into the corporation's DP budget.

Harris added that a vendor's maintenance personnel and consulting services ought to be judged along with its equipment.

Timetable Enforces Deadlines

To make sure that the system meets its deadline, Bernacchi proposed drawing up a project timetable as part of the contract between user and vendor.

The advantage of an agreed-upon timetable, he said, is that it clearly defines the responsibilities on both sides of the negotiating table, prevents later finger pointing in the event of a disaster and promotes frank relations between user and vendor.

Perhaps the most important thing for the user is the correct negotiating attitude, according to Bernacchi. And he caught that attitude in a negotiating table statement: "There are certain basic things we want from you, or we simply won't do business with you." That's a very effective argument in contract talks," he concluded.



*Our PasswordTM
Modem's
sophisticated
new
control panel*

**THE BUSIER YOU ARE,
THE BETTER YOU LIKE IT.**

PASSWORDTM is a modem so efficient and convenient there is little to do but turn it on to transmit at 300/1200 baud. Operating features include auto dial/answer, auto mode/speed select, full/half duplex. PASSWORD has all this, plus a two-year limited warranty, at a price of just \$449.*

TELPACTM telecommunications software (optional) programs PASSWORD to transfer files, in terminal or host mode, with multiple error checks. Phone directory gives choice of timed automatic or one-touch dial and logon. Command mode includes file display and update, menus and help, and much more. Write or call for complete specifications.

*Suggested list for PASSWORD complete with power, phone, RS232 Interface cables. TELPAC software optional extra, \$79.

PASSWORD, TELPAC, USR logo and U.S. Robotics are trademarks of U.S. Robotics Inc.

3113

 **U.S. ROBOTICS INC.**
 1123 WEST WASHINGTON
 CHICAGO, ILLINOIS 60607
 (312) 733-0497

☐ Tell me more about PASSWORD, TELPAC.

NAME _____
 COMPANY _____
 ADDRESS _____
 CITY/STATE/ZIP _____
 TELEPHONE _____

3113

What to Look for in a DP Manager

Q During the last three years we have had two directors of the DP department. As director of personnel, I am responsible for recruiting for all department head positions.

I hired both DP directors and relied heavily on input from people in the DP department in my final evaluation of candidates. As a result, the overriding criteria became technical capability. Neither of the people hired has lived up to our expectations, and we are currently searching for a replacement.

We have learned our lesson, and this time we hope to look past technical capabilities and hire someone with the potential to move our department forward in computer ap-

plications. Could you give us a personality profile of a successful DP manager?

A The successful director of an information services function commands the technical respect of his peers in management information systems, sets a good example in attitude and work, is committed to excellence (within the constraints of reality), is committed to the corporate good, downplays the "mystique" of computers, has a commanding presence and is comfortable in a peer relationship with top management, is innovative and generates a continuous string of ideas, is not afraid to make and stand behind a decision, is willing to get involved

in risky projects and is genuinely concerned about the welfare of workers within his realm of responsibility.

Q After receiving my Ph.D. in economics, I took a faculty position at a major university's school of business. I spent seven years in the economics department. Five years ago I took an interest in computers, transferred to the management department and began teaching courses in information systems.

We now have three professors with computer or information systems specialties and authorization to hire three more. We are having trouble attracting qualified people

Turnaround Time

By Larry E. Long

because the dean and the department chairs are reluctant to recognize information systems as other than a support function.

On numerous occasions we have approached the administration about consolidating information systems education into a separate department. They say that their primary concern is to strengthen the traditional areas. Do you have any wisdom that I can use to counter this position?

A I question their wisdom. To maintain the attitude that information systems is a support function in a school of business is a step backward. Smart business school administrators are paying a great deal of attention to the ordered growth of an information systems program. They recognize that a progressive information systems program is the best way to strengthen traditional curricula.

You may be aboard a sinking ship. If you do not detect a radical change in attitude by the end of the semester, I would suggest that you take a position elsewhere. There are plenty of openings.

Q I am a senior systems analyst with over 16 years in data processing. Over the years I have designed and implemented several systems for the IBM System/3 and IBM System/34. Can you tell me the best method to market these systems?

A I can't conceive of a more risky entrepreneurial venture than an individual entering the market for proprietary software aimed at well-established hardware. If your planned product orientation is along the lines of standard systems, I am reluctant to offer much encouragement.

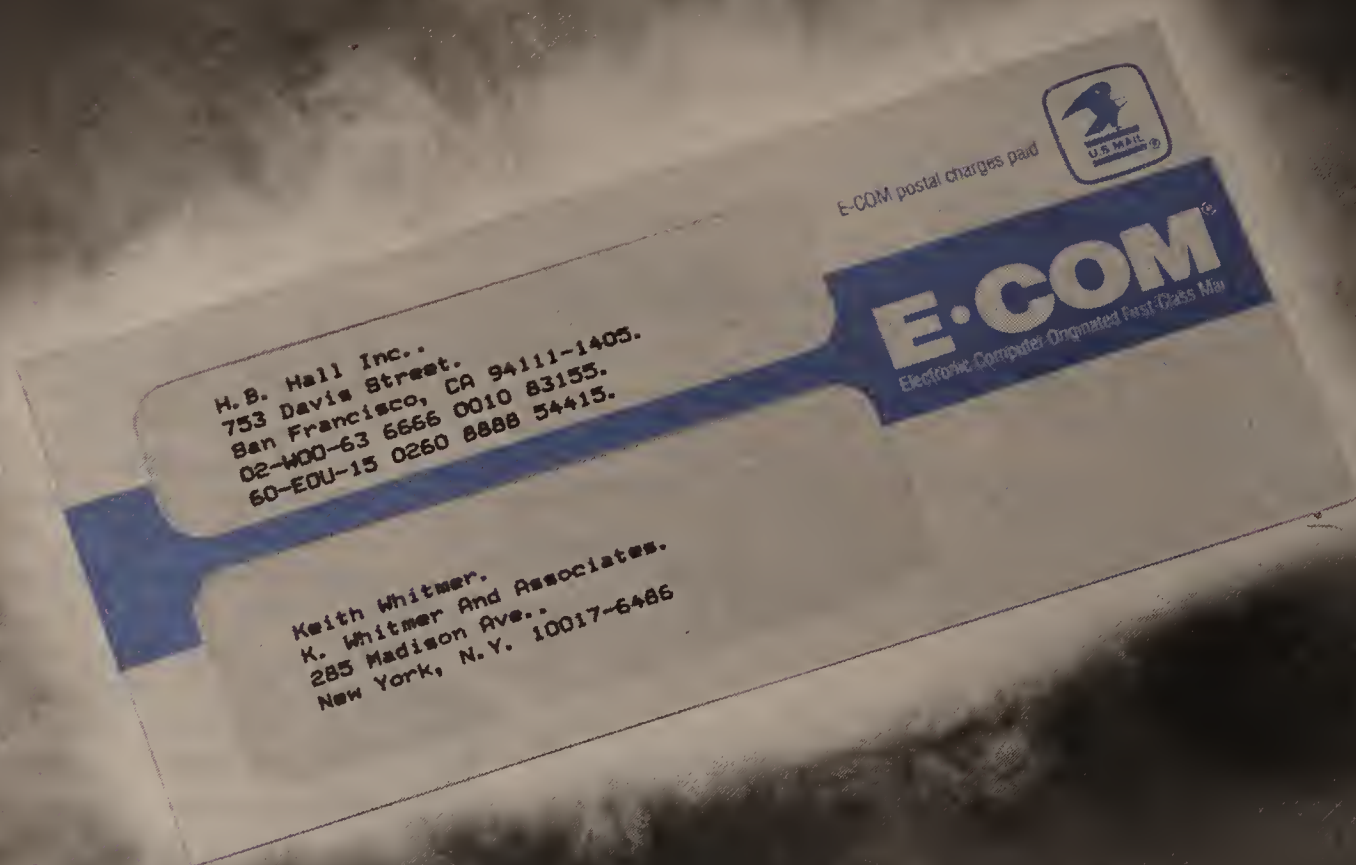
However, if you have a unique product that is state-of-the-art and noticeably superior to the existing alternatives, then opportunity does exist.

Unless you have plenty of seed money and finely tuned marketing skills, I would recommend that you first try to sell your products to an established hardware or software vendor. Such an establishment will have the distribution network and sales force needed to market your product successfully.

You will increase the probability of success if you design a product that uses the full potential of recently introduced hardware.

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

Management may never know the power of this envelope.




Unless you tell them.

You don't have to tell management how easy it is to implement E-COM® service. That can be your secret. Tell them instead about the power of an E-COM service mailing. How letters can be sent right from the company computer. How the Postal Service prints, folds, inserts, seals and delivers these letters for you. How the distinctive blue envelopes of E-COM service lend visibility and impact to your mailing.

Since you're the one who gets E-COM service up and running, you have three options—all of them easy. First, you can write the system interface yourself. It takes about a day, and Postal Service consultants are

standing by to give you any help you need. Second, you can buy a dedicated interface from a third-party vendor. Third, you can access E-COM service through an independent communications carrier, without bringing the system in-house at all.

As part of the D.P. department, you're in a unique position to tell your management about the power of E-COM service. So find out more. Call your local Postmaster. You may never again get so much credit for so little work.

E-COM® 

Announcing the MidFrame™ for the development programmer.

It turns backlog into a quaint, old-fashioned notion.

Now you can demolish that backlog and save a lot on development costs. Just put the DIALOGIC/ONE™ MidFrame System between your mainframe and your interactive development programmers.

The high-performance MidFrame provides a turnkey development solution that's unprecedented. Users get

much more done. In less time. Because the MidFrame delivers consistent subsecond response time. What's more, it gives MVS/TSO development programmers advanced interactive processing facilities never before seen in mainframe shops. Things like knowledge-based editors that "know" just what to do. Without being told!

The smart COBOL editor includes automatic syntax checking. Cross-referencing. Formatting. Scanning. Zooming. And more.

There are compound search functions. Undo/redo, too. A powerful, consistent command language that's easily expanded. Plus sophisticated window management—with multiple split screens—for processing and tracking multiple concurrent activities.

Nothing to lose but TSO overhead.

The MidFrame employs a unique layered approach that distributes functions while integrating them thoroughly and transparently into the MVS/TSO environment. Thus, data integrity, security and ease of use are assured.

All TSO facilities and MVS data sets/files are accessed via an ISPF-like editor that requires virtually no retraining. All other VTAM applications are available in passthrough mode.

While the highly reliable MidFrame is peerless as a development machine, it's also an uncommonly cost-effective alternative to CPU upgrades. That's because you can offload up to half of your interactive program development workload to the MidFrame.

Designed to keep pace with emerging technologies, the MidFrame lets you grow without penalty. Just add functions, users or more hardware power as needed.

Call or write for complete information: Dialogic Systems Corporation
1335 Bordeaux Drive, Sunnyvale,
CA 94089 (408) 745-1300.
Continental U.S.: (800) 831-8011.
California: (800) 227-1445.

*Bringing mainframes
into the mainstream.*



MidFrame, DIALOGIC/ONE and DIALOGIC/10 are trademarks of Dialogic Systems Corporation



Generally Satisfied With Performance

Most Senior Accountants Found Using Micros

By Peter Bartolik
CW Staff

NEW YORK — The majority of senior management accountants use microcomputers in their daily business activities and are generally satisfied with equipment performance, a survey recently conducted by the National Association of Accountants (NAA) found.

According to NAA research associate Suzanne Connors, "Senior managers now indicate they have hands-on experience, [and] they're becoming dependent on the microcomputers in much the same way as [they are on] calculators."

The NAA mailed questionnaires to a sample of its 95,000 members and pro-

cessed 700 responses from senior management personnel, a majority of whom are controllers and treasurers. Those responding were employed in nonmanufacturing firms, service industries and the financial industries; respondents also included consultants employed in a wide range of industries.

Almost 60% of the respon-

dents, 414 out of 700, said they or their staffs use microcomputers to perform daily activities. And nearly half of the respondents (321) said they personally use microcomputers in their daily activities.

Microcomputer use was indicated by more than 50% of respondents from companies with annual earnings in

the \$10 million and under and \$30 million and over ranges, while usage was less than 50% in the \$10 million to \$29.9 million range.

Of the five respondents with more than 500 people in their departments, only one said microcomputers were used by that respondent's staff. But use increased to almost 60% in departments employing less than 25 people; 580 of the 700 total respondents work in departments of that size.

General Satisfaction

General satisfaction with systems was reported by 368 of the 414 respondents with micros in the office, but 170 also said they had been dissatisfied with particular aspects, ranging from memory limitations to slow speed.

In the offices in which there presently are no microcomputers, 33.7% of the respondents (or 13% of the total survey) indicated one or more units will be purchased in the next 12 months.

IBM's was the most frequently used computer, indicated by 32% of the respondents with micros in their offices. Apple Computer, Inc. units came in second with almost 23%. Epson America, Inc. apparently was most favored as supplier of printers, with 106 respondents indicating the use of Epson units. Only 49 respondents indicated the use of hard disk or Winchester storage, while 217 indicated they relied on floppy disks.

Spreadsheets were the most popular applications software package, being used in 82.4% of the departments with microcomputers. Word processing was the second most popular package, with 66.9% of the departments with micros using such applications. In most areas, the respondents indicated that applications programs were purchased. In particular areas, such as budgeting and financial analysis, respondents reported more packages were written in-house than were purchased.

THE NEXT GENERATION



Gen-V™

A true 32-bit microprocessor for both centralized and distributed data entry with unbeatable price/performance

Only Gen-V gives you all of this in one system:

Terminals, local and remote, 2000-character screens, with tilt/swivel features

Integrated data entry, file management and report writing

Innovative user-friendliness, with menus and English-like language

ANSI 74 COBOL and BASIC high-level languages available

Multiple concurrent communications, batch and interactive

Winchester disks, ranging from 10 to 120 megabytes

Supermicro power, multiuser/multifunctional

High-speed throughput, concurrently in centralized and distributed environments

Come up to state-of-the-art data entry with the Inforex Gen-V.

Call 800-225-3397.

INFOREX

In data entry, we are the answer.



'It's No Use ... He's Cash'd in All His Chips.'



NEW!
IBM PC and
DEC PRO 350

Statistical and Reporting Software

SPSS Inc. a leading producer of statistical software for over 15 years, with more than a half million manuals sold in 80 countries, is making micro waves with SPSS/PC and SPSS/Pro.™ Two powerful new statistical and reporting programs which were designed for the IBM Personal Computer and the DEC Professional 350.

POWERFUL STATISTICS

- ☐ Crosstabulations
- ☐ Analysis of variance
- ☐ Multiple regression
- ☐ Over 25 integrated procedures

CUSTOM DISPLAYS

- ☐ Automatic or custom reports
- ☐ Fully labeled tables
- ☐ Plots & graphs

TOTAL INTEGRATION

- ☐ File management of large or small data sets
- ☐ Input & output to popular PC programs
- ☐ Flexible data transformations

EASY TO LEARN

- ☐ Simple English commands
- ☐ Tutorial & demonstration diskette included
- ☐ Comprehensive documentation for all levels of users

SPSS inc.

444 N. Michigan Avenue
Chicago, Illinois 60611
(312) 329-2400

For the DEC Professional 350, and soon for the IBM PC with hard disk. To discover how SPSS can help you make waves, call us for the full story. (312) 329-2400.

SPSS, SPSS/PC and SPSS/Pro are trademarks of SPSS Inc. for its proprietary computer software. IBM PC is a trademark of IBM Corporation. DEC and DEC Professional are trademarks of Digital Equipment Corporation.

© Copyright 1983, SPSS Inc.

Securities Center: A Case Study in DP Conversion

NEW YORK — When Denmark's bond trading industry made the switch over a single weekend from a paper-based system to one that is completely electronic, there was no opportunity to look back.

Since then, VP-Centralen, the Danish securities center that was established to handle the conversion, has become a case study, its vice-president, Henrik Dines Hansen, said in a recent interview here.

"We abolished everything about the old system virtually overnight. We were con-

ducting business the Monday after the Easter holiday, and we have increased our transaction productivity by 20%," Hansen said.

The center could not perform a parallel conversion test because the information all had to be converted at the same time. "There was no turning back. We had to go with it and not look back."

Fortunately for Hansen and VP-Centralen, there was no need to "turn back," and he subsequently decided to publish a chronicle of the successful conversion in a book called *Up and Running*,

which will soon be released by Yourdon Press here. "[Yourdon, Inc.] had helped in the consulting stage of the project, and they thought it would make a good story," Hansen said. "I actually had the manuscript ready before the conversion went off — I knew I was going to be successful — and I just had to add a few pages."

Asked if he thought it was ironic for Denmark — whose money supply is tight and, on a global scale, small — to be taking this leap into the future with a totally electronic bond trading system, Hansen replied, "The less money you have, the more you need to move it fast. This is the challenge for countries like Denmark and Sweden. You have to be very efficient with whatever you have."

Hansen maintained that the world is closer than it realizes to becoming a paperless society and predicted that Denmark will soon electronically automate its system of stock trading. He also

thinks Norway and Sweden will be interested in what Denmark has achieved at VP-Centralen.

"Sweden had to shut down their trading during the market boom last spring. They couldn't cope with the paperwork. They couldn't settle, so they had to stop doing business for a week."

Hansen anticipated that in automating finance around the world, more software

products are coming along like Intel Corp.'s Intel Data Base Information System (Idis), a multiuser mainframe-to-micro link that acts as a buffer in the Danish system. "You need products like Idis to help solve the data anarchy problem: global processing and maintenance vs. individual information processing needs. That's the only way to deal with application backlogs."



LineMaster

An intelligent device for dial-in access to your mainframe 3270 BiSync line.

LineMaster

is a communications watchdog which keeps a line in service until a user dials in.

- For any remote 3271/4/6 line, up to 19.2K baud.

- Compatible with any 3270 BiSync emulator including microcomputers.
- Connects between modem and mainframe.
- Installs in minutes.

\$639.



MicroFrame, Inc.
205 Livingston Avenue
New Brunswick, NJ 08901
(201) 828-4499



VP-Centralen, the Danish Securities Center

IIT RESEARCH INSTITUTE Rome, New York

IIT RESEARCH INSTITUTE (IITRI) is an independent research organization founded in 1936 to provide research, development and design services to government and industry. Today, IITRI ranks as one of the largest and best known not-for-profit contract research organizations and continues to extend its capabilities to effectively meet research challenges of our changing society. The **IITRI** facility in **Rome, New York** has openings for experienced professionals with the following credentials:



Software Technology Research Manager

Position requires a B.S. or M.S. in Computer Science or related discipline, and a minimum of 10 years experience in the computer field which must include the management of personnel.

Position will involve the management of a group of software engineers and computer scientists performing software engineering research/development of special purpose databases.

Programmer/Analysts

B.S. or M.S. in Computer Science or related discipline, and a minimum of 2 years computer experience involving DoD applications. Will formulate, organize, lead and provide major technical contributions to software technology studies, prepare technical reports, and identify new business opportunities.

If you are interested in professional growth offering increasing responsibility, advanced educational opportunities, an opportunity to enjoy the casual lifestyle and recreational ambiance of upstate New York, send your resume to: **C. Todner, Professional Staffing, Dept. R1200, IIT RESEARCH INSTITUTE, 10 West 35th Street, Chicago, IL 60616.** We are an equal opportunity employer M/F/V/H. U.S. Citizenship Required.



Planning EDP Expansion? New Site? Modernizing?

WE PACKAGE DATA CENTERS

We design, engineer, build — meeting and beating deadlines, even when building over, around or under you — without costly interruptions so you can maintain your business as usual. Most of our projects are accomplished in half the time.

We are the engineers and builders of more than
600 DATA CENTERS

If you are a quality conscious company wisely interested in performance as well as economy, we can construct a building to house your computer facility, alter an existing floor, or rejuvenate and expand your present facility, including your total support area.

Simply call or write to arrange a convenient meeting to discuss your project, concepts, and budgets. In confidence, of course.

(212) 674-8600

DP FACILITIES INC., NATIONAL

Div. F.C.I. Facilities Construction, Inc.
250 Park Ave. South, N.Y., N.Y. 10003

Denmark First to Shred Paper Securities for EFT

By Susan Blakeney
CW Staff

NEW YORK — Paper securities are a thing of the past in Denmark, which has become the first country in the world to replace them with electronic funds transfer (EFT).

During a recent visit to the U.S., where he hopes to convince American banks to follow suit, the man behind the new system outlined how an entire country moved from shuffling manual securities to EFT. Henrik Dines Hansen, vice-president of VP-Centralen, the Danish securities center, provided the details of a system that was converted to EFT on April 1 and has been operating successfully since then.

Denmark converted its paper securities to an electronic system in order to stop the flood of paperwork associated with issuing and trading bonds. "Because of Denmark's highly complex mortgage credit system, which finances private homes, bond trade exceeds \$80 billion dollars, or 1.5 times the country's [gross national product] . . . the amount of paper transactions that was involved was staggering," Hansen said.

Recognizing this problem in 1975, Denmark's Ministry of Housing appointed a commission to propose alternatives to the paper securities system. Hansen, who had previously worked in a data center owned by some Danish banks, became project adviser for the commission.

The group recommended the creation of a national DP securities center, which would eventually become VP-Centralen, and Hansen was chosen to direct the standards and methodologies for system development of the center. Hansen's strategy comprised a three-pronged, 10-month analysis leading to his decision to pick software first and then determine the most appropriate hardware configuration.

Hansen first conducted a technical comparison of five data base management systems (DBMS), including Sperry Corp.'s DBMS 1100, Software AG's Adabas, IBM's IMS, Cincom Systems, Inc.'s Total and Intel Corp.'s System 2000. During the second phase, he evaluated the level of support offered by the software vendors.

"There were three finalists that we thought could do the job, but we thought Intel's potential was the strongest. We wanted a vendor that could accommodate us and provide service five years down the road," Hansen said.

The final planning phase involved testing the DBMS using a full-scale model of the future application. IBM had just released its 4300 mainframe, which worked well with VP-Centralen's mock-up of the system, according to Hansen. During this phase, the decision to go with System 2000 was confirmed.

It was not until May 1980 that the Danish Parliament formally authorized the creation of VP-Centralen — some five years after its foundation had been laid — and Hansen was appointed vice-president. The data center was to serve only as a repository of information, Hansen explained, funded by Denmark's commercial banks, savings institutes, brokerage firms, mortgage credit institutions

and the Federal Reserve Bank.

The decision to burn all Danish paper securities in favor of the new system was announced by VP-Centralen two years ago at a conference held by the Association of System 2000 Users for Technical Exchange [CW, March 30, 1981]. The projected conversion was to be completed this year; after "intensive and meticulous planning, the conversion occurred precisely on schedule and without a single software bug," Hansen claimed.

According to Hansen, the System 2000 DBMS, which runs on the center's three IBM 4341 Group 2 mainframes, has made for a smooth transition.

"Investors can obtain their securi-

ties in the same way they always did — from their banks or credit unions — but instead of receiving paper bonds, they simply receive statements from the banks of all their transactions. These cannot be used as legal tender," he added.

All transactions are registered on an account in VP-Centralen's data files, and the transfer of securities becomes valid only by registering the transaction in the computer.

Because 95% of the paper bonds were already on a DP system in either a Danish bank or credit house, the 1,500 end users of the new system only had to extend their existing communications networks within the financial sector to include VP-Centralen's data center.



CW Photo by S. Blakeney

H.D. Hansen

FOR SERIES/1: GET REMOVABLE AND FIXED STORAGE IN ONE DRIVE.

Easy to operate, with reliable front-loading disk cartridges.

Fast, simple back-up: data can be easily copied from fixed to removable storage.

Full software compatibility with IBM 4963 disk subsystems.

13.3 Mbytes removable storage per cartridge, 64.5 Mbytes fixed storage per drive.

Save space: Dual CMDs mount in a single cabinet for 155.6 Mbytes of storage.



Attach your Series/1 to Control Data Cartridge Module Drives.

Fixed and removable storage in one drive—that's the unique feature you get with the Certainty® 280 Series CMDs. Fully compatible with IBM 4963 subsystems, these Control Data units make your Series/1 more effective than ever before, just like the other Certainty Series drives.

So fast, simple on/off-site back-up is the major benefit. You can use the removable, reliable cartridge for storing application programs, or for backing up your most critical data—while both fixed and removable storage remain available on line.

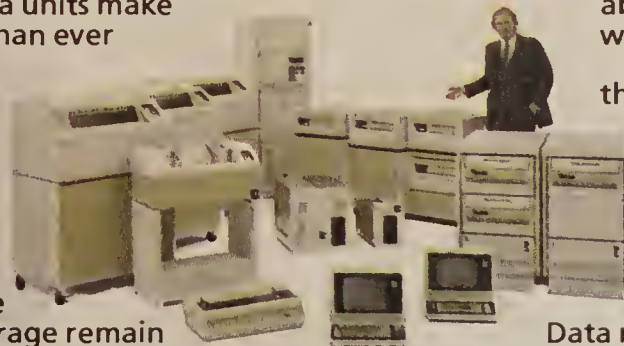
Because the controller card is already included,

these CMDs are ready for direct connection to the I/O bus of your Series/1—a feature you'll find on all Certainty drives. And all Certainty products are available now. You can put them to work immediately.

Add in complete support: More than 5000 Customer Engineers help make sure that Certainty miniperipherals live up to their name.

Make increased effectiveness a Certainty. No matter how you're using your Series/1, a Control

Data miniperipheral will pay off for you in price and performance. Call today for more information, toll-free 800/328-3390.



CD CONTROL DATA

Addressing society's major unmet needs
as profitable business opportunities

Chinese Engineer Outlines China's DP Strategy

BALTIMORE — While the Chinese computer industry is producing a wide range of fourth-generation computer products, there is still a vast development potential in the People's Republic.

So said Yang Tian-xing, the deputy chief engineer of the North China Computer Technology Institute, during a presentation on "Computing in China" that he delivered at the recent Data Pro-

cessing Management Association Conference here.

The computer industry in China is largely directed by two government bodies, the Electronics Industry Ministry and the Machinery Industry Ministry. A number of specialized research institutes, such as the Beijing Computer Technology Institute, and academic research centers also contribute to the advancement of computer

science. "They are all devoted to the development, production and application of computers," Yang explained.

Yang admitted that the utilization of computer equipment in China is still sparse. He compared China's installed base to that of Spain, which ranks 12th in the world.

China imports most of its computer technology from the U.S. (37%), Japan (30%),

France (9%), West Germany (8%), the Soviet Union and East European countries (6%) and the UK (3%). The remainder of equipment comes from a smattering of other European countries.

Unlike the West — where transaction processing often accounts for 75% to 80% of computer activity — China uses computers primarily for scientific applications (29%), Yang reported. Transaction

processing accounts for only 2% of their use.

Main Obstacle

One of China's main obstacles in catching up with Japan and the West is the development of efficient Chinese-character information processing systems. Yang noted that China uses as many as 50,000 complex Chinese characters and another 20,000 simplified ones; this presents unique problems in terms of encoding, data compression and lengthy I/O efforts. Advances are being made, nonetheless, to overcome these obstacles, Yang maintained.

"Computing in China has undergone 30 years of development and achieved very great progress. The production system of the industry has been initially formed; the scientific research centers have been established and are being continually strengthened; and we now have a number of computer specialists of high academic level.

"If there had not been that decade-long setback, our achievements would have been greater. . . . Due to the unnecessary setbacks lasting from the mid-60s to the mid-70s, the number of professional personnel graduating from computer departments only amounted to about 30,000.

"Today the developing situation after China's economic transformation and the effective measure taken by the government to maintain further an open-door policy, have promoted the academic exchange between Chinese computer specialists and their foreign counterparts."

Specifically, Yang outlined the following future for China's computer industry:

- The state will greatly increase its investment in computer industry and enterprises.

- In three to five years, Chinese medium- and small-scale integrated circuits will greatly boost their output capacity while their costs go down.

- A viable Chinese software industry will evolve soon.

- Production will be stepped up in the areas of minicomputers and microcomputers.

- The open-door policy will facilitate the introduction into China of advanced technology from foreign countries.

- Advanced computer production lines will continue as will research and production on large-scale integrated circuits.



Reliable.

You can count on 3M diskettes. Day after day.

Just like the sun, you can rely on 3M diskettes every day. At 3M, reliability is built into every diskette. We've been in the computer media business for over 30 years. And we've never settled in. We're constantly improving and perfecting our product line, from computer tape and data cartridges to floppy disks.

3M diskettes are made at 3M. That way, we have complete control over the entire manufacturing process. And you can have complete confidence in the reliability of every 3M diskette you buy.

Look in the Yellow Pages under Computer Supplies and Parts for the 3M distributor nearest you. In Canada, write 3M Canada, Inc., London, Ontario. If it's worth remembering, it's worth 3M diskettes.



3M hears you...

3M

SPECIAL INTRODUCTORY OFFER FOR NEW SUBSCRIBERS.* SAVE \$5.00, PAY ONLY \$39.00 FOR A FULL YEAR'S SUBSCRIPTION.

(Basic Annual Subscription Rate is \$44.) *U.S. ONLY

*lo Other Publication Gives You SO MUCH Timely News, Money-Making Ideas & Management Information—
PLUS Specials & Bonus Issues!*

As a weekly newspaper, **COMPUTERWORLD** gives you thorough and timely coverage of news and ideas of interest to computer users in industry, business, government and education. Unlike monthlies, **COMPUTERWORLD** covers hundreds of relevant news items each week. But beyond the “news” you get much more as a CW reader:

- Weekly “In Depth” articles.
- Monthly “Special Reports” on selected subjects.
- **COMPUTERWORLD BUYER'S GUIDE SERIES** . . . a comprehensive series of product-specific lists and up-to-date information on each major product area.
- **COMPUTERWORLD OA** with incisive coverage of office automation.
- **COMPUTERWORLD ON COMMUNICATIONS** covers product and system developments in the rapidly changing communications field.
- **PLUS** Other Special Issues Throughout The Year!

SUBSCRIBE NOW

Complete Form On Reverse,
Then Return In Attached
Postage-Paid Envelope. Or Use Your
Charge Card and Call
TOLL-FREE: 1-800-343-5730.

- ☐ Please enter my subscription (details on back)
- ☐ I'm already a subscriber, but I'd like you to change my:
- ☐ address ☐ title
☐ industry ☐ other
- My current mailing label is attached and I've filled in new information on the other side.**

Put old label or label information here



COMPUTERWORLD

**Special Introductory
Only \$39.00 Save \$5.00**

[illegible]

If charge we must have
cardholder's signature: _____

First Initial	Middle Initial	Surname										
Your Title												
Company Name			2.									
Address												
City			State			Zip Code						

Address shown is:

☐ Business

☐ Home

☐ Check here if you do not wish to receive promotional mail from Computerworld.

☐ Check here if you're interested in receiving information on Computerworld's Index.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT. 375 Cochituate Road, Rte. 30, Box 897,
Framingham, MA 01701-9985

[illegible]

BUSINESS/INDUSTRY (Circle One)

End Users

10 Manufacturer (other than computer)
20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail Trade
50 Business Service (except DP)
60 Government—State/Federal/Local
65 Public Utility/Communication Systems/
Transportation
70 Mining/Construction/Petroleum/Refining
75 Other User

Vendors

80 Manufacturer of Computers, Computer-related Systems or Peripherals

85 Computer Service Bureau/Software/Planning/Consulting

90 Computer/Peripheral Dealer/Distributor/Retailer

95 Other Vendor

11	President/Owner/Partner/General Manager
12	VP/Assistant VP
13	Treasurer/Controller/Financial Officer
21	Director/Manager/Supervisor DP/MIS Services
22	Director/Manager of Operations/Planning/ Administrative Services
23	Systems Manager/Systems Analyst
31	Manager/Supervisor Programming
32	Programmer/Methods Analyst
35	OA/MP Director/Manager/Supervisor
38	Data Comm Network/Systems Mgmt
41	Engr./Scientific/R&D tech Mgmt
51	Mktg Sales Reps/Sales Marketing Mgmt
60	Consulting Mgmt
70	Medical/Legal/Accounting Mgmt
80	Educator/Journalist/Librarian/Student
90	Other

COMPUTER INVOLVEMENT (Circle all that apply)
 types of equipment with which you are personally involved either as user, vendor or consultant

A. Mainframes/Supers
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

BRAZIL

SAO PAULO — An agreement to develop jointly a superminicomputer has been reached here between IBM and Itautec, an equipment manufacturer belonging to Brazil's Itau Bank. Another agreement is said to be in the works that calls for the implementation of a network linking IBM mainframes to Brazilian banking terminals.

FRANCE

PARIS — A joint marketing agreement was reached here last week by two of Europe's office machine superpowers, Carlo Olivetti, Inc. and CII-Alcatel. CII-Alcatel will sell Olivetti electronic typewriters, and the two companies will collaborate on a new company to develop a new generation of electronic typewriters featuring Zilog, Inc. Z80 microprocessors, micro floppy disks and electronic spreadsheets. In addition, Olivetti will market the CII-Alcatel videotex terminal.

TOULOUSE — A terrorist anti-computer group that calls itself the Committee for the Struggle Against Computers claimed credit for a fire that was set in Sperry Corp.'s office here the night of Oct. 25. No one was in the systems office at the time of the fire, which the group said it set to protest the U.S. invasion of Grenada. In the last two years, the group has bombed offices of CII-Honeywell Bull, Philips Data Systems, Inc. and software vendor CAP Gemini.

JAPAN

TOKYO — Hitachi Ltd. has installed its supercomputer, the high-speed array processor S-810 Model 20, at the University of Tokyo's Computer Center, which is used by all computer students at the university. The supercomputer features a main memory of 64M bytes and operates at speeds of 630M floating-point operations per second.

TOKYO — Toshiba Corp. has released an optical character recognition (OCR) system that is reportedly able to read 500 kinds of handwritten Kanji and Kana characters in addition to printed Japanese words. The OCR-V595 system, according to Toshiba, will enable users to input data 60 times faster than with traditional keyboard input methods. Furthermore, the vendor predicted that the market for such devices is growing at an annual rate of 30%, and some 3,600 systems will be sold in 1983. The standard OCR-V595 system is priced at \$107,660 and will be available in December.

SWITZERLAND

GENEVA — The French Postal Telephone & Telegraph Administration (PTT) took the wraps off Telecom 1 at the recent Telecom '83 Conference here. The satellite-based digital network service is expected to be operational sometime in 1984. Also on view was AT&T's videotex terminal called Sceptre, which will reportedly come in a microcomputer version with videotex capability and support European standards in the near future.

UNITED STATES

BOSTON — During a recent "trade mission" to the U.S., the

Northern Ireland Partnership stopped here in an attempt to dispel its country's reputation for being a war zone and to promote high-technology business ventures there. The Belfast-based group, composed of business executives, bankers, trade unionists, academics, technologists and industrial development specialists, hailed its country as the "gateway to the European Common Market" and introduced a package of incentives for potential investors.

WEST GERMANY

MUNICH — German participants at this year's IBM Users Group conference, held in Oxford, England, reportedly were unhappy with IBM's

plans to "stabilize" Virtual Storage Personal Computing (VSPC), the concept that allows Personal Computer users to store information on IBM mainframes and do away with floppy disks. The IBM policy will, at the same time, force DP service centers to switch to alternative time-sharing environments such as IBM's TSO and VM/CMS, which calls for massive conversions of application software, critics said. In big installations, labor costs could run up to 45,000 man-hours because IBM has not come up with "usable conversion tools yet," according to one user. The user group's executive board plans to bring this problem before IBM Europe.

UNLEASH THE POWER of your IBM PC® with Fox 10-BASE™

NEW, from Fox Research.
10-BASE is the most powerful, easy-to-use Data Base Management System *ever* designed for IBM PCs and compatibles. And, at just \$495, it's a powerful value.

10-BASE speaks "IBM"®.
We translated IBM's Sequel (SQL) into "PC" to put flexibility and astonishing power at your fingertips.

Power to let you grow into networking as your business grows.

Power to do your job with fewer commands.

**Do more.
Do it better and faster.**

Access as many files as you need, with as many records per file as you want. Create new "files" from existing files with a single command. Then use

the automatic Data Dictionary to overview everything.

The whole idea, after all, is to spend your time evaluating information, not looking for it.



RESEARCH

30-Day Free Trial

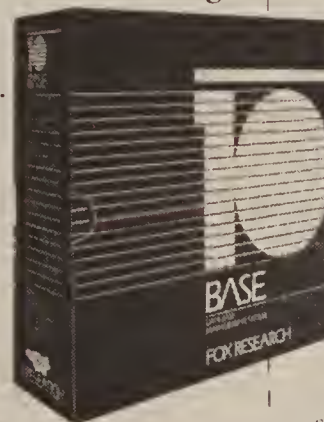
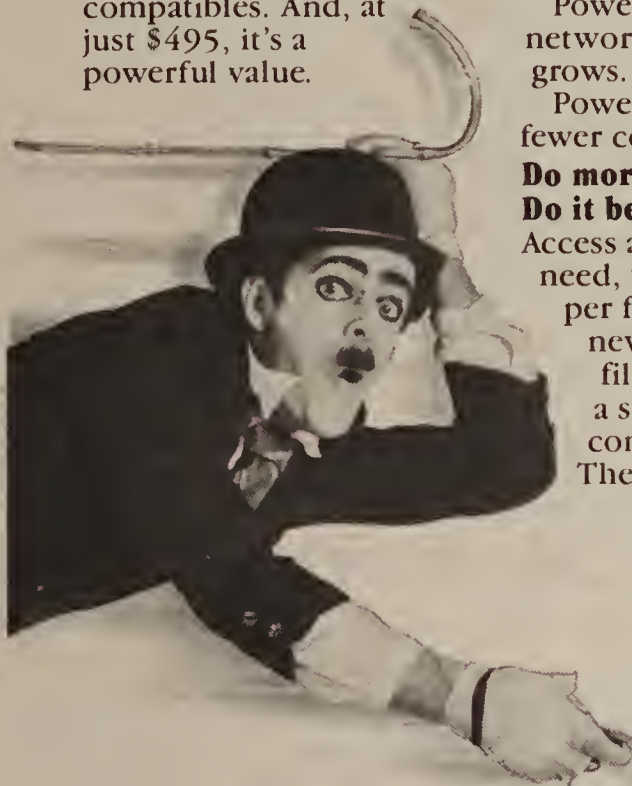
☐ YES! Here's P.O. # _____ for \$495.00 (plus applicable tax). I want to try 10-BASE on a 30-day trial basis. If I'm not completely satisfied, I'll return my 10-BASE and cancel my P.O.

☐ Send more information.
☐ Send me your dealer package.

Name _____
Title _____
Company _____
Address _____
City _____
State, Zip _____
Phone _____

Send To: Fox Research, Inc., Attn: Greg Goodall, National Sales Manager, 7005 Corporate Way, Dayton, Ohio 45459. Or call: **800/358-1010**. Or **800/782-1010** in Ohio.

(Even better, attach your business card here)



A subsidiary of ComGen Technology, Inc.

See 10-BASE and our new networking 10-NET at **COMDEX/Fall '83** booth # W240.

Message From EPS Keynoter:

MIS Manager 'Must Become Agent of Change'

By John Gallant
CW Staff

BOSTON — In a corporate environment marked by well-educated, highly aware end users, the information systems manager must become "an agent of change, an information czar" in order to survive.

That was the message delivered by Leslie Ball, professor of information systems at Babson College in Wellesley, Mass., in his keynote address to EPS, Inc.'s 1983 User Group Conference here last week. A frequent lecturer on information systems management, Ball said that management information systems (MIS) managers will have to focus on strategic plan-

ning rather than technical expertise to satisfy the demands of an increasingly sophisticated community of end users.

According to Ball, the MIS manager faces users who are highly educated and more familiar with the information resources that are, or should be, available to them. With the advent of micros, Ball said, those users are now spread through every level of the corporation, even to the carpeted confines of the chief executive officer.

Employees have become "knowledge workers" and demand more and better information to perform effectively. "The end users are now

better aware of trends and capabilities. The users want new tools, and they want them fast," Ball said. "They have an increased perception of the information systems services that they're getting, and they know when the MIS department is not doing its job."

But the MIS manager, faced with such economic constraints as high interest rates and the shortage of capital, must learn to "do more with less."

No longer, Ball said, can the DP staff easily justify programming cost overruns or the addition of more and more equipment. The MIS manager will have to learn to compete with

other executives for corporate funds.

All of this points to the importance of long-range, strategic planning by the MIS manager, Ball emphasized. "The MIS manager is faced with a moving target. He needs to be a strategic planner to keep ahead of needs, because those needs change so fast. He will have to manage strategy rather than hardware, and if he can't do that he won't survive. It's no longer so important to be technically knowledgeable — the most important skill today is management."

The implication, according to Ball, is that the MIS manager must "become political." The successful DP professional will combine the skill of managing a technical staff with the ability to understand the needs and responsibilities of end users to become a "manager of managers." And, to balance the need for service with the shortage of resources, the MIS manager must make users aware of the true cost of information services.

"He must achieve a high profile within the organization. He must be viewed as a leader and not simply as a technical person," Ball said. "It's imperative that he learn who's important within the company and how to get things done. To be successful, he must be seen as an agent of change, the gatekeeper and the information czar."

New Responsibilities

Ball said the introduction of microcomputers clearly illustrated the new responsibilities MIS professionals must undertake. "When the personal computer was introduced, most MIS managers blew it badly. They were certain that these things were a fad, that they'd just go away. In the future, MIS managers have to take the lead in planning, not just react to change."

That strategic planning, Ball explained, will be necessary to coordinate the use of an increasingly wide variety of hardware and software products available to end users. More importantly, the MIS professional will need a sound strategy to manage what Ball labeled the "total-access world."

"We're moving to an environment where users demand access to all the information they want. That's a great opportunity to open the MIS world to them. But it also implies ethical and security problems. That area is one of both opportunities and problems that the MIS manager will have to address," Ball said.



The new AJ Passport. Take it along.

The business world has been waiting for it. Here it is. The AJ Passport. A perfect balance of portability, power, and versatility wrapped up in IBM PC compatibility. Made for professionals, fully supported by Anderson Jacobson.

The Passport is portability taken seriously. Compact and light-weight, it stows beneath an airline seat in a rugged travel case. Its typewriter-style, fully-configured keyboard tucks away when you're not using it, saving space.

Yet the Passport is a portable powerhouse. It tackles complex business problems. Quickly. With Intel 8088 16-bit processing, 256K bytes of user RAM, and 640K bytes of IBM PC-compatible diskette storage.

The Passport's industry-standard MS-DOS operating system runs most IBM PC-compatible software including BASIC A and other powerful packages for financial modeling, text editing, communications management, graphics and programming.

And AJ offers a host of fully supported proprietary software for still more applications. So your investment is well-protected from obsolescence.

Passport's features combine comfort, convenience and performance for unequalled versatility. A non-glare, high resolution amber screen. A 300 baud built-in modem. Ten soft keys. And built-in, pushbutton tutorials such as "help" and "explain."

The Passport expands easily with a broad line of AJ peripherals including full-size monitors, high-speed modems,

terminals and printers. So installing and maintaining a company-wide system is less complicated, less costly.

When you buy from AJ, you buy support. Lots of it. Applications and systems specialists. A user Hotline. And a wide range of individually tailored training and service plans. All designed to analyze problems and offer solutions.

Powerful, compatible, supportable, desk-top decision making from Anderson Jacobson. Now you can take it along.

Write or call for more information. Anderson Jacobson, Inc., 521 Charcot Avenue, San Jose, California 95131, (408) 946-2900; Eastern (201) 794-9316; Central (312) 671-7155. Also in Canada, the U.K., and Europe.



**ANDERSON
JACOBSON**



'Twenty Years Ago, XX63 Was Brought Into Accounting — Young, Shy, a Little Frightened . . .

AT SAVINGS
UP TO **50%**

IS YOUR 4300 SALESMAN CONFUSED?

END THIS CONFUSION WITH...

PROCESSOR

PERIPHERALS

USX

FIELD ENGINEERING

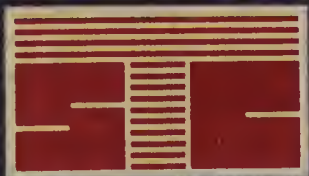
SUPPORT

4300 Plug-Compatible
Complete Business
Systems

THE USX44 -- DESIGNED FOR USERS BY USERS --

OFFERING:

- Increased System Availability • Additional Virtual Storage
 - Separation of ON-LINE, BATCH and TEST WORKLOADS
(with the insurance of a Fail-Soft System)
- Making **STC Ultimacc** The BEST Solution!



STC Ultimacc Systems, Inc.

A subsidiary of
Storage Technology Corporation

Four North Street • Waldwick, New Jersey 07463 • (201) 445-5050

YES, I WANT TO END THIS CONFUSION
☐ Please rush me more information about USX 44 Complete Business Systems.
☐ Please have a product representative call me.

Name _____

Title _____

Address _____

City _____

State _____

Phone _____

Zip _____

Current System _____

Outdated System Costs Montana \$2.5 Million In Lost Taxes

JEFFERSON CITY, Mont. — An outdated computer system has cost the state of Montana between \$350,000 and \$2.5 million in uncollected state income taxes, the state auditor's office here has reported.

The amount is based on a discrepancy in taxes owed by individuals but not billed because the computer system is incapable of detecting those people, according to Ken MacNevin, public affairs officer for the state auditor's office.

"The system wasn't picking them up," MacNevin said, explaining, "When a taxpayer pays 80% of his tax liability throughout the year in withholding and installment payments, unless the tax payment meets one or more of the exceptions in the tax form, he gets an addition to his tax that's owed, a penalty for not paying enough of it on time. The individual income tax section has not established an alternative procedure for identifying these nonpayers."

According to MacNevin, the problem could be rectified by updating the Department of Revenue's technology, and the collection of tax dollars by the state could proceed more efficiently.

The problem reportedly lies in the computer program, which was developed in the mid-1970s and has only been revised to keep up with legislative changes in the tax laws. "We have not revised the system to keep up with modern technology," said Hal Hebert, manager of Tax Production Systems for the Division of Revenue Information Services Division. "We're working on that."

None of the systems in place for corporate income tax, individual income tax and employer withholding tax are less than five years old, MacNevin added.

"The corporate income tax system went in in 1967, the individual in 1973 and the employee withholding system in 1977. Of course if you're talking about a 1967 computer system, it's like talking about a 1934 Model A."

French Group to Issue Smart Cards in 1984

PARIS — Intelmatique, the international marketing bureau of the French telecommunications industry, announced recently that 1½ million "smart" cards will be issued in 1984 by the Ministry of Post and Telecommunications.

The multiservice Smart Card is a plastic, credit card-size credit device containing one or more embedded programmable microcircuit chips with memory storage capabilities. Intelmatique said the cards will initially be used for public pay telephone service, payment for videotex services, decoders for pay television and payment for conferences and special events at permanent exhibition and conference sites.

The card will also reportedly be used by some savings account customers of two postal bank institutes.

IAT to Beam Data Communications Forum

ROCKVILLE, Md. — The Control Data Institute for Advanced Technology (IAT) has announced the third edition of its Data Communications Update seminar, to be beamed by satellite to 10 cities on Dec. 5.

IAT data communications instructor Gary Zielke will conduct the seminar. The program will focus on current developments and standards and explore future trends in this rapidly changing field.

Topics will include local-area networks, the emerging technology of integrated voice and data, the impact of office automation on data communications and packet

switching services from Bell Laboratories as well as from competitors.

The seminar will be beamed to the following locations:

- From noon to 4 p.m. — Atlanta: Atlanta Marriott Northwest; Boston: Sheraton Mansfield Inn; New York: Sheraton LaGuardia; and Washington, D.C.: Twin Bridges Marriott.

- From 11 a.m. to 3 p.m. — Chicago: Sheraton International O'Hare; Houston: Houston Astro-dome Marriott; and Minneapolis: Bloomington Marriott.

- From 10 a.m. to 2 p.m. — Denver: Denver Marriott South-east.

- From 9 a.m. to 1 p.m. — Los Angeles: Los Angeles Marriott; and San Francisco: Sheraton at Fisherman's Wharf.

Registration is \$195 per person, if payment is received prior to the seminar. For every three participants from the same organization registering together, a fourth participant may register without charge.

If the institute has to bill registrants after the seminar, the fee is \$245 per person.

Additional information on the Data Communications Update seminar is available from IAT, located at 6003 Executive Blvd., Rockville, Md. 20852.

ORDER
Acme Engineering places a \$50,000 order for your product.

1. ORDER ENTRY
Your customer service representative enters the Acme name, and MSA's Order Processing System checks credit information and product availability.

2. CREDIT CHECKING
The system does it automatically. If Acme's order doesn't pass the credit check, it's placed on hold until it's reviewed by the credit manager.

3. INVENTORY AVAILABILITY
If inventory is short in one location, the system displays inventory levels in your other warehouses or plants.

MSA introduces the shortest distance between two points. New MSA Order Processing.

MSA's remarkable new Order Processing System keeps every order on track and on schedule.

It automatically checks credit and inventory availability. Schedules shipping. Bills customers. Immediately throws a red flag if there's a problem.

Then resumes the process when the problem is resolved.

It's the perfect way to keep your customers satisfied.

Now they won't have to wait while your customer service representative keys in line after line of information. The system automatically displays addresses, preferred shipment and other order-related information.

It also instantly checks current credit records, saving your service representative that time-consuming task.

Customer inquiries are a snap with MSA's

Manager's Role to Reflect Shift Computers Seen Moving to Industry Front Lines

By Jim Bartimo
CW Staff

CHICAGO — Computers have moved from a support role to the front lines in areas including the banking and airline industries. This shift in the computer's role will change the way we look at data processing and the way we do business.

That was the message John Diebold delivered at the Integrated Office Technology Conference and Exposition held here recently. The chairman of the New York-based Diebold Group, Inc. gave a featured presentation on the corporate effort toward office systems integration. "You must ask yourself what is the

role of automation in your business," he said. "Information technology is becoming a determinant of competitiveness."

Communications Department

Among the changes brought about by the proliferation of computers is the increased role of the technical communications department. Diebold suggested that one scenario would be to combine data processing and communications into a single department. This would be helpful to the communications department because network design now requires a large staff, he said.

The role of the data processing

manager will also change. Once head of the "information factory," he will soon become a policymaker as more end users acquire desktop machines. "It's changing from a wholesale activity to a retail activity," he said. Pointing to what he called "an analytical void when it comes to system integration," Diebold said the corporation must change its method of evaluating the computer. "We measure people and machines that are displaced rather than the time/value of the information," he noted.

Most of the changes coming into data processing and the business world start with the advent of the personal computer and microproces-

sor. Although the large computer has been in existence for about 30 years, it is only now that "we have a num-



CW Photo by J. Bartimo

"Information technology is becoming a determinant of competitiveness," John Diebold recently told a conference in Chicago.

ber of computer-literate people," Diebold said.

As consumers become more computer-literate and microprocessors creep into everything from home appliances to automobiles, some unexpected changes may take place. For instance, a home appliance with a resident microchip will be able to dial a service center when it breaks down, determine its own problem and the best method of repairing itself "without reference to the home owner," Diebold predicted.

Info/Software Set for June 12 In Chicago

NEW YORK — Info/Software, a new, exclusively software exposition, will be held at Chicago's McCormick Place next June 12-14.

Exhibits at the show will cover applications and systems software for mainframes, minicomputers and microcomputers, with an emphasis on products for business, industry or institutions.

Software for games, homes and entertainment will not be permitted, according to a spokesman for the show's organizer, Clapp & Poliak, which also sponsors the annual Information Management Exposition & Conference (Info).

The creation of the show was spurred by the interest in the Software Center at Info, which was 60% larger in 1983 than the previous year, the spokesman said.

Prices for admission to the exhibition floor are \$5 in advance and \$10 at the door. Pricing on conference registration will be available in December.

More information is available from Clapp & Poliak at 708 Third Ave., New York, N.Y. 10017.

4. SHIPMENT SCHEDULING

Necessary shipping documents are automatically printed. Your shipping department enters confirmation online, and Acme's shipment is on its way.

5. ACCURATE BILLING

Invoicing is also automatic. MSA's online realtime system means prices are current, billing accurate.

system. It lets you review the status of orders, prices, credit or inventory availability at a moment's notice. You can change orders easily.

And the system is flexible enough to handle special requests for shipping vendors, packaging, delivery dates or special handling procedures.

Just as important, MSA's online realtime system helps you control internal costs. It moves orders along without costly error or duplication of effort. It provides current information on pricing, discounts and special sales agreements with individual customers.

And it's a powerful tool for controlling inventory, since you can conveniently check on inventory status daily.

You'll find MSA's new Order Processing System

flexible and easy to use. It works with the MSA Manufacturing System to let you schedule production more efficiently. And promise ship dates to customers more confidently. Of course, it's also perfectly integrated with MSA's Financial System.

If your company is ready for a dramatic improvement in your order processing, contact Robert Carpenter at (404) 239-2000. Or write Management Science America, Inc., 3445 Peachtree Road, N.E., Atlanta, Georgia 30326.

MSA

The Software Company

Report Writer 'Travels' With User's Auditors

HOUSTON — Report writing against a data base is often complicated by the technical considerations involved in reading the data base as well as the scarcity of generalized report writing packages capable of interfacing with multiple data bases. But a Fortune 500 manufacturing company here is using a generalized data base interface to do the job.

Cooper Industries em-

loys approximately 30,000 people, has annual sales of approximately \$2.3 billion and is made up of more than 15 independent divisions that manufacture a variety of products ranging from scissors to portable drilling rigs, from fiber-optic wire to jumper cables and from drapery rods and miniblinds to gas compression equipment.

The company's data processing functions are decen-

tralized. Each division works with the hardware, software and application systems that are best suited for its particular product line and customer base.

Any report writer selected to be used throughout the 15 divisions had to run on any IBM mainframe operating system and interface with both Cullinet Software, Inc.'s IDMS and Cincom Systems, Inc.'s Total data base man-

agement system. Partly because Carleton Corp.'s report writer Auditec met these criteria, it was selected in 1981 for use by Cooper's internal auditors.

"We were looking for a report writer that was easy to use and easy for a nonprogrammer to learn," said Robert Hevle, director of internal auditing, "and it was essential that the report writer be portable from division

to division, from system to system."

Before Cooper purchased the package, auditors relied on whatever report writers — if any — were installed within the individual divisions. As part of a plan to create an integrated auditing function, Cooper searched for a single report writer that could be used not only throughout the corporation, but also by all auditors, rather than just by DP auditors, a Cooper spokesman said.

Cooper spokesman Paul Cowley is particularly pleased with the package's portability. On field audits, the system is typically installed, and productive work is being accomplished on the morning the auditor arrives at the field location. Once the audit is complete, the system is "deinstalled," with the contents of the dictionary saved for possible use in future audits, Cowley said.

Hidden From Users

Data base jargon is said to be hidden from end users because data bases are defined to the dictionary in much the same fashion as non-data-base files (both data base and non-data-base files consist of records and fields). To support the generalized data base interface, two additional entities are defined to the dictionary: record indexes (relating all records of the same type in a particular sequence) and record links (relating two or more different record types). All supported data base files are defined in this manner.

Cowley said that when he began to work with the IDMS data base, "the dictionary was set up by someone with very little knowledge of any data base, and it worked. I never thought it would be that easy." Shortly, Cowley will be working at a Cooper division using the Total data base management system, and he expects that the process will be equally simple.

Once a data base file has been defined to the dictionary, end users can code report requests using the same programming rules that are used for non-data-base files. There is never a need for the end user to be familiar with the calling protocols usually needed to access data base files; the system constructs these bases on the dictionary definition of the file and the system's knowledge of the supported data base management systems.

With the variety of report formats that can be produced and the flexibility of the programming language itself, the package has many features of a report writer, Cowley said.

We just gave the computer industry something to reach for. A new standard... performance/footprint.

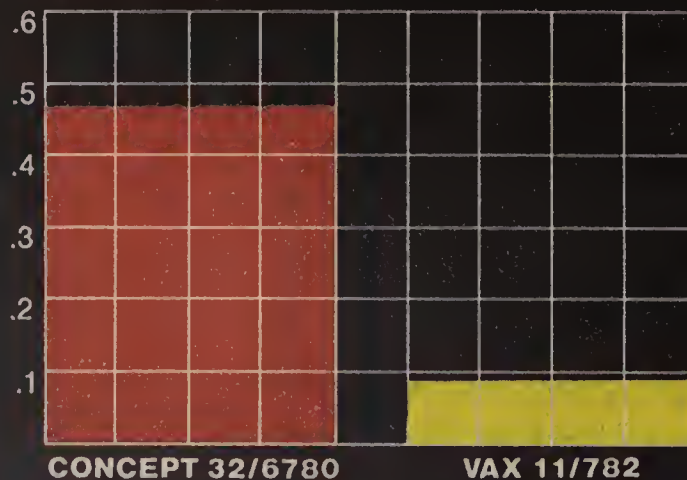
Introducing the Gould CONCEPT 32/67. Performance in a size as accommodating as its price.

From the 32-bit performance leader comes yet another minicomputer product line other suppliers can only hope to duplicate. The 2-MIPS-class, cost and space-saving CONCEPT 32/67.

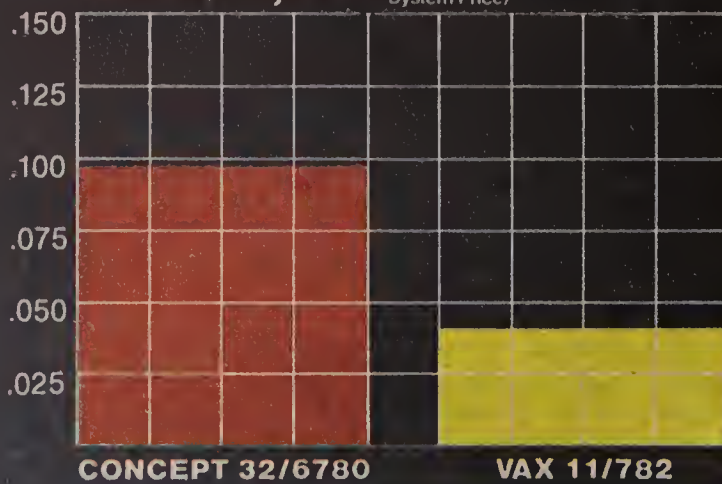
We scrimped on size, but that's all. The 32/67 gives you top computational power in 1/5 to 1/3 the floor space of the competition. And it's packed with features. Performance up to 2.6 MIPS. Largest cache in a mini...32K byte two-way set associative with separate 16K banks for data and instructions. And, 16M byte task addressing in a base register mode. All at a price that matches its size.



MIPS/SQ. FT.*



MIPS/\$10,000* (Equivalent System Price)



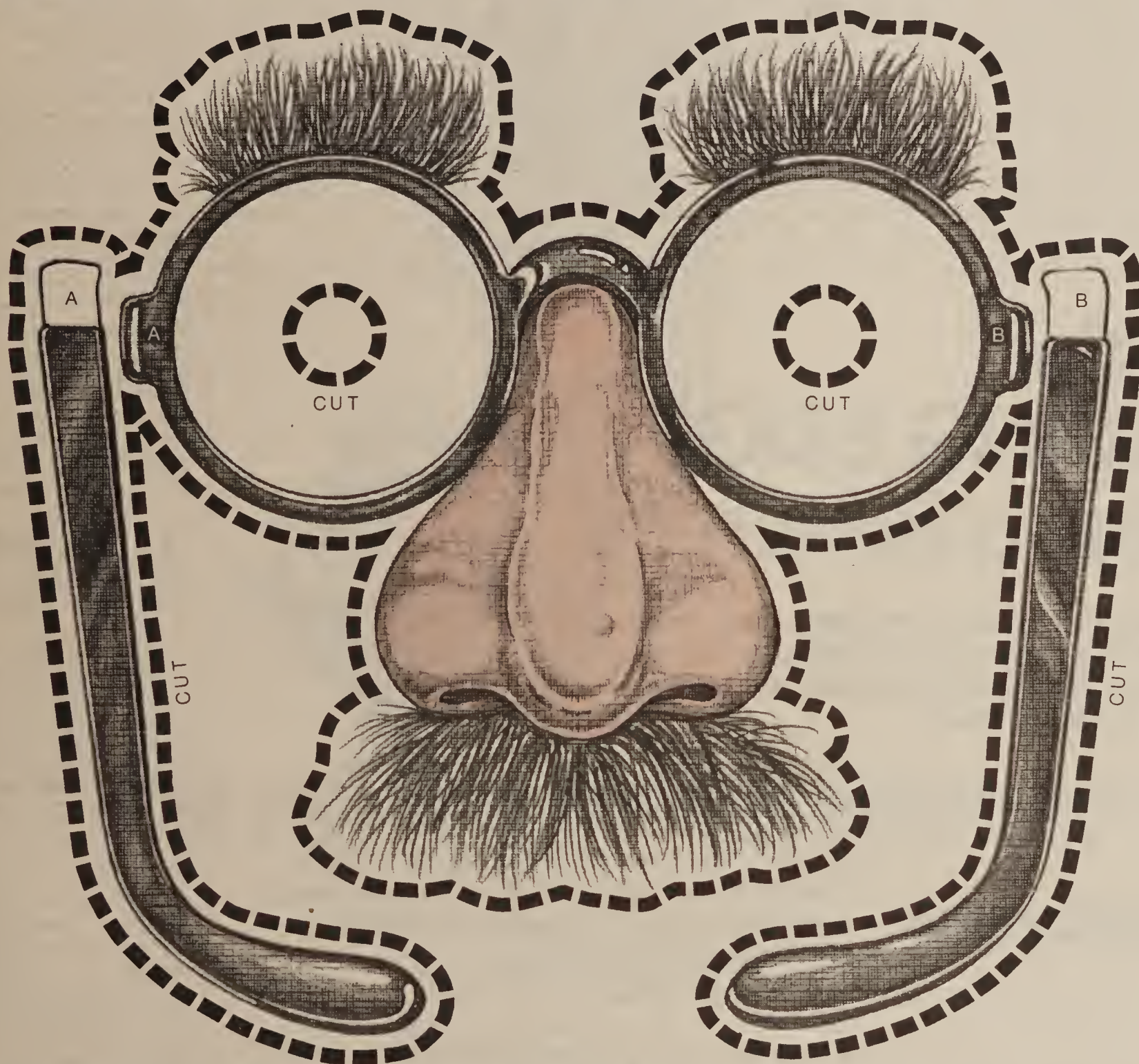
* All chart data from published competitive information.

For more information about the new standard of minis, call or write: **Gould Inc., S.E.L. Computer Systems Division**, 6901 West Sunrise Boulevard, Fort Lauderdale, Florida 33313. 1-800-327-9716.

GOULD
Electronics

VAX 11/782

WHAT TO WEAR TO WORK IF YOU BUY THE WRONG DBMS INSTEAD OF OUR MODEL 204.



Picking the best, most productive DBMS for an OS, DOS or CMS environment requires the use of all your faculties. Because many DBMSs never live up to their promises. And sooner or later those deficiencies are bound to catch up with you. Leaving you looking for something to hide behind.

Computer Corporation of America doesn't have to put on an act to convince you. Our MODEL 204 DBMS is the only commercial DBMS ever designed from scratch for online systems. Every other DBMS was converted from batch. And that means new applications come up faster with MODEL 204. In fact, 5 to 50 times faster. And your applications and databases are much easier to maintain.

What about performance? If you end up with a DBMS that can barely carry a few million records and a dozen or so users, you won't be able to mask the fact forever. Especially if someone finds out that MODEL 204 can handle up to 513 billion records and 999 concurrent updates.

Now the advantages of MODEL 204 are available for the DOS/VS(E) and native CMS environments. Without sacrificing either performance or productivity.

In the DOS world, MODEL 204 is the only DBMS with a direct teleprocessing interface. Which saves the resources and

productivity costs of a terminal monitor.

Our native CMS implementation outperforms other DBMSs because it utilizes its own I/O routines without modification to either VM or CMS.

Finally, two other things that no other DBMS can say. MODEL 204 received the highest overall rating in a recent *Datapro* survey: 3.5.¹ And it's the fastest growing system for IBM mainframes from an independent vendor.²

Now faced with these facts wouldn't you look silly buying anything but MODEL 204 DBMS?

MORE ON MODEL 204 DBMS.

CW11/14G

- ☐ Make a presentation. ☐ Let's put MODEL 204 in and benchmark.
☐ Send me a brochure. ☐ Send me info on free DBMS seminars.
 Operating Environment: ☐ OS ☐ DOS ☐ CMS

NAME _____ TITLE _____
 COMPANY _____
 ADDRESS _____
 CITY _____
 STATE _____ ZIP _____
 TELEPHONE _____

**Computer
Corporation
of America**

Four Cambridge Center, Cambridge, MA 02142 (617) 492-8860

1. *Datapro*: "User Ratings of Proprietary Software-COMLETE" November 1982. 2. *Computerworld*: December 20, 1982.

Other Offices: New York, Houston, Dallas, Los Angeles, San Francisco, Chicago, Philadelphia, Washington, D.C., Morristown, NJ, Stamford, CT/Representatives: Canada, U.K., Europe, Australia, Japan, Saudi Arabia.

Printers Handle Output From Different CPUs

CALGARY, Alberta — A Canadian company with diversified interests in insurance, property management and resort operations solved a hardware problem from a hard-copy angle by installing a switching system that allows two printers to handle output from both an IBM and a Digital Equipment Corp. processor.

"Our IBM 4341 was using two high-speed printers [IBM 3203 Model 5] — a very costly operation, especially since the output need was really equivalent only to about 1½ printers," explained Vi Sadler, director of computer services for the Cascade Group here. "At the same time, our two DEC PDP-11/70s, one of which we knew would be phased out within 12 months and the other

somewhat later, were functioning with two old 300 line/min printers, which were not operating at an efficient level."

Besides the IBM 4341 — soon to be upgraded to an IBM 3033 — Cascade's Computer Services Division uses an IBM 4331. The two PDP-11/70s will be eliminated in favor of a distributed data processing system using PDP-11/44s this year.

Confronting its output problem, Cascade's DP operations staff consulted with Southern Systems-Canada in Willowdale, Ont., which provides users with printer systems compatible with most computer processors. Cascade decided to use two 1,100 line/min Southern Systems QT 1100 printers together with Southern

Systems' PS-10 switcher.

"The two Southern Systems printers take up far less space than the IBM 3203 printer," Sadler said. "The two actually fit into space that would be required for one IBM printer."

"The difficulty in achieving this versatility previously was that the electronic interfacing needs of the DEC and the IBM are so different that only very, very costly switching systems could have accomplished what the PS-10 does today, very inexpensively," added Steve Miller, vice-president of information systems for Cascade. "Having the two printers — switchable either to the DEC or the IBMs — also gives us a backup output system should one have any downtime."

The Cascade Group companies include Family Life Insurance Co., Sovereign Life Insurance; Sovereign-General; Merrett Management Ltd., a property management firm; and the Panorama Ski Resort. "Our DP operations serve all those companies," Miller said.

"The biggest applications are the administration of the insurance policies in the life and casualty business. These are large systems running on IBM," he said.

"The DEC equipment has been used for most of our noninsurance needs — the reservation system for Panorama Ski Resort, as well as property management functions for Merrett, plus general ledger and accounts payable for all those companies."

"Because Cascade has to support such a diversity of applications, we require a diverse set of tools — the necessity for having both DEC and IBM. It's been very cost-effective for us to use the two Southern Systems printers on the three computers. The alternative would have been two printers for the IBM and two for the DEC — a costly solution."

Get the LEADING EDGE... Datapro Seminars

Prepare yourself NOW, by registering for Datapro's exciting 1983-84 selection of Seminars. We still have openings for November-December Programs, so call our "800" number today!

Choose From The Latest Seminars On ...

DATA COMMUNICATIONS

- Data Communications: Concepts and Systems
- Data Communications: Effective Network Design
- Local Area Networks: Selection Guidelines
- IBM Teleprocessing Software
- IBM Systems Network Architecture

MICROCOMPUTERS

- Personal Computers: Strategies for Managing
- Microcomputers: Selection and Application
- Distributed Systems Design for Micros
- Data Base Systems for Micros
- Personal Computers: A Hands On Experience

INFORMATION SYSTEMS

- Information Systems Modeling
- Information Center Concepts and Implementation
- Fourth Generation Languages
- Computer Business Graphics

Call Toll Free to register... for more information and for our Free Catalog

800-257-9406

New Jersey 609-764-0100. Your reservation will be confirmed immediately!

Datapro Seminars are conveniently offered in most major cities.

datapro / **mc**

1805 Underwood Blvd. • Delran, New Jersey 08075



'Top Secret' Meet Set for Dec. 7-9

ORLANDO, Fla. — The first annual conference for users of CGA Computer Associates, Inc.'s Top Secret security package will be held at the Marriott Inn here Dec. 7-9 by the Top Secret International Committee.

Security consultant Jack Bologna will deliver the keynote address on how to sell access-control security to upper management. Workshop sessions will cover auditing facilities, password management, application protection, auditing MVS, technical support personnel and CICS considerations.

The registration fee for the conference is \$250 per person. Registration forms are available from CGA Computer Associates, 960 Holmdel Road, Holmdel, N.J. 07733.

Users Guides List Service Organizations

PALMYRA, N.J. — The Service Research Group here has made available three users guides listing independent service companies, particularly those servicing personal computers.

The "Independent Service Directory" is said to cover 262 companies, with company name, address, telephone number and corporate officer.

The "Independent Service of the IBM Personal Computer" provides profiles of 25 independent servicers of IBM micros, including information on service features, service contract, average response time and geographic areas serviced.

The "Independent Service of Applications and Systems Software" includes profiles of 105 companies, including company data and annual and service revenues.

Priced at \$19.95 each, the reports are available from the Service Research Group through Box 335, Palmyra, N.J. 08065.



No more waiting.

IBM System/38 now provides direct access for up to 128 work stations, plus greatly enhanced communications.

It works like a much larger computer, yet it's a compact, easy-to-use system.

And now, we've upgraded System/38 in almost every way.

We've doubled maximum main storage, to 8 megabytes. Increased maximum disk storage from 2,672 to 6,225 megabytes. Increased work stations from 80 to 128. Added BASIC to the currently supported RPG and COBOL.

System/38 can now communi-

cate with virtually all IBM computers, office systems and terminals, and with the IBM Personal Computer.

Converting IBM System/34 software is easier than ever. And an array of industry application packages is available, covering manufacturing, distribution, hospitals, hotels, apparel and transportation.

IBM System/38: thanks to its advanced data-base architecture...

It increases programmer productivity...

It lets users share programs, data files and system resources online, on a real-time basis...

And now, it lets more people than ever share information at the same time.

To arrange for a free demonstration of System/38, call your local IBM representative or *IBM Direct's* toll-free number below. Or send in the coupon.

**For a brochure or free demonstration:
IBM System/38**

Write today to: IBM, DRM, Dept. BK3
400 Parson's Pond Drive
Franklin Lakes, New Jersey 07417

☐ Please send me a free brochure about the IBM System/38.

☐ I'd like a free demonstration of the IBM System/38.

NAME _____ TITLE _____

COMPANY _____

STREET ADDRESS _____

CITY _____ STATE _____ ZIP _____

BUSINESS PHONE _____

IBM

90

Call *IBM Direct* 1 800 IBM-2468 Ext. 90.

Paint Maker Finds Right Order, Invoicing Mix

PITTSBURGH — The problem was clear. PPG Industries Chemical Group needed to improve its order processing and invoicing (OPI) system, which linked its network of sales offices, distribution centers and manufacturing facilities across the country.

However, the original system, operating on the management information systems (MIS) department's twin IBM 3033 processors, was complicated. The system consisted of 825 programs and took more than 25 man-years to develop.

The OPI system did the job, but was becoming increasingly inefficient in light of PPG's growing requirements. In addition, applications development was slowed because the system required constant maintenance by the programming staff at PPG, one of the country's largest manufacturers of flat glass, industrial coatings, paint and strand fiberglass.

The solution involved rewriting the entire OPI system, using Cincom Systems, Inc.'s Mantis package. The package not only allowed the firm to rewrite the entire system in less than one year, but to do it with less than half the 150,000 lines of code in the original program. It also took only 5½ man-years to complete.

According to MIS manager Michael Crowley, the firm began its search for a solution to its software problem by forming a study team. The team began to explore applications development software to use in updating the OPI system — including the addition of on-line order entry capabilities. The team also wanted a package that would increase programmer productivity and reduce applications development time.

After reviewing 10 leading devel-

opment tools, the team eventually whittled the pool to three: Cincom Systems, Inc.'s Mantis package; Culinet Software, Inc.'s Adds-On-Line; and IBM's Development Management System.

System Brought Up in One Day

"We were able to bring the system up in one day, despite the size of the OPI system," explained Tony Liberoni, manager of the firm's operations and systems. "We had contingency plans in case the system came down, but we didn't have to implement them because Mantis gave us the ability to correct bugs almost immediately after we discovered them."

When a customer order is entered into the renovated OPI structure, the

system determines the manufacturing facility closest to the order destination, assigns a shipping date and selects appropriate routings and transportation. The system also generates the necessary paperwork, including invoices and bills of lading. Because shipping notices can be printed at any manufacturing facility within minutes of order entry, rush orders can be handled easily.

According to Crowley, the Mantis package has also increased programmer productivity by as much as 35%. The new OPI system has also reduced the drain on Crowley's programming staff, allowing programmers to devote an average of 80% of their time to application development and the rest of the time to pro-

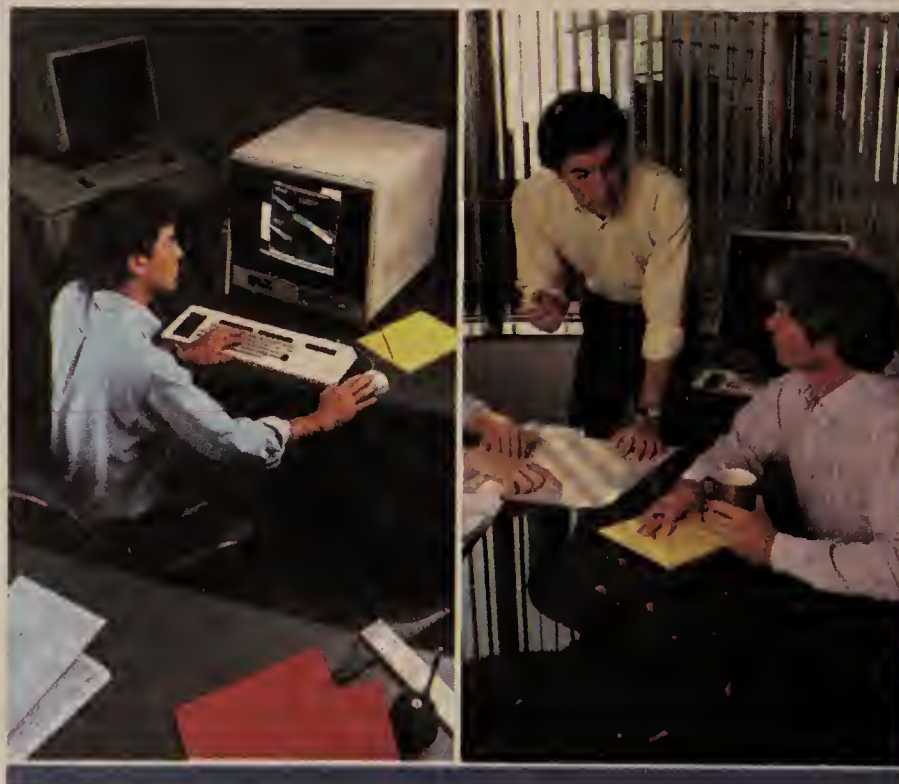
gram maintenance.

The OPI project is only the first step in a major overhaul that the PPG Chemical Group's MIS department has planned. Crowley said that some manufacturing sites are operating antiquated batch systems which often require the full-time attention of an analyst just to keep them functioning.

The programming staff, as a result, has begun updating the company's base of manufacturing support applications, such as storeroom inventory control, wage and payroll, purchasing, accounts payable and maintenance management.

"Using Mantis, we will update each system as an integrated, data base-oriented system," Crowley said.

Apollo recognizes the fact that there are two sides to every professional.



There's a part of a professional that involves their profession.

Then there's the part that goes to meetings, makes presentations, does budget, prepares documents.

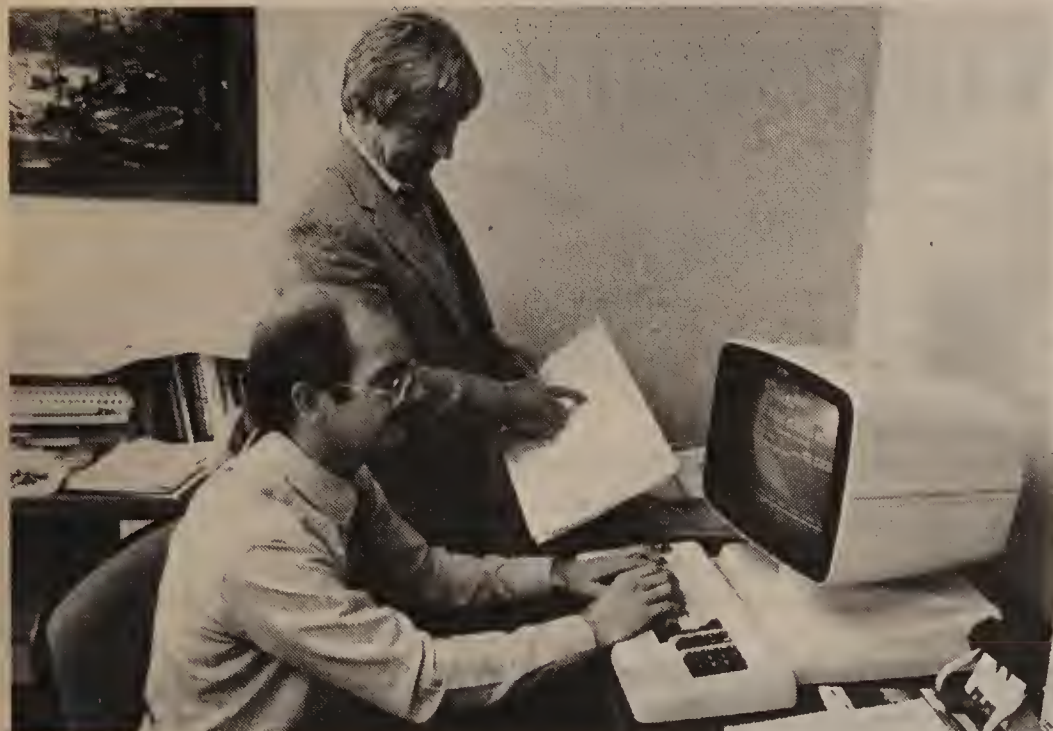
Guide Helps Banks Develop Micro Programs

ATLANTA — Computer Based Solutions, Inc. (CBSI) has announced the publication of *Micros in Banking*, said to be a complete guide for banks, savings and loans and thrift institutions to use in the development or improvement of microcomputer programs.

In addition to 22 case studies, an overview of trends and a listing of 20 software firms, the book includes chapters on the following topics:

- Sorting out the facts and myths about micros.
- To write or buy software.
- How to buy the right brand of hardware.
- The micro's proper place in banking.
- Micros as transactional processors.
- Micros as analytical instruments.
- The people-micro relationship.
- Budgets and costs.
- Data security.
- How to buy asset and liability management software.

The book can be purchased for \$75. CBSI is located at Suite 1148, 3390 Peachtree Road N.E., Atlanta, Ga. 30326.



Data Ten, Inc. President Ed Allen (standing) discusses a system inventory update with Bill Palmer, the service bureau's telecommunications analyst.

Bureau Clients Get Features Of Personal Computers With Terminal-CPU Link

IRVINE, Calif. — Top management at Data Ten, Inc. has found a way to provide the computer service bureau's customers with the operating features of a desktop personal computer — but without the personal computer.

Instead, Data Ten customers can link a remote terminal to the service bureau's central IBM computer and use it as if it were a personal computer. The equipment cost is a few hundred dollars for a terminal and modem, and the "personal computer" customers have greater storage ca-

capacity available and a wider variety of peripheral devices to call upon.

"The key is that we've used existing software to provide a relational data base that lets the mainframe computer look exactly like a user-friendly personal computer," explained Edward D. Allen, president of Data Ten, which serves Orange County, Calif. "Users log on their terminals, build their screens, allocate their disk file space, do their data entry and then generate whatever reports they need from that data."

The primary CPU is a 6M-byte IBM 370/158-3, whose peripheral equipment includes three high-speed line printers and a laser printer; 40 IBM 3330 disk drives; eight tape drives; 32 IBM 3278-compatible terminals for in-house use; and a card reader/punch. Teleprocessing capabilities include an IBM 3705 equivalent front-end processor with low-speed asynchronous dial-up support, bisynchronous high-speed line support for both remote job entry and time-sharing operation and Systems Network Architecture capabilities for other devices.

The mainframe operates under the OS/VS2 MVS/SP operating system with a variety of user features for multiple console support, teleprocessing, time-sharing, remote job entry and multiple file-access methods, Allen said.

Internal Applications

Data Ten added the PNMS-II network management software package from Peregrine Systems, Inc. of Irvine, Calif., in early 1983 to maintain its own equipment inventory and manage problems relative to the network. As Data Ten's staff became more familiar with PNMS-II, it began to use the package to develop internal applications including computer housekeeping tasks, related accounting subroutines and electronic mail.

PNMS-II is also used in Data Ten's personal computer user approach. It was originally intended to maintain the network inventory and present management information in reports. It provided files, screen formats and relationships between files that are all user-defined without programmer assistance, Allen said.

PNMS-II includes a relational data base system, a problem management facility and a report writer facility. The problem management facility is used by Data Ten customers for data entry and specification of information relationships. The data base is the collection point for all user files. The report writer permits extraction of data from any files.

The problem management facility allows users to define any number of categories and lay out screen formats for them, Allen noted. The screen format utility defines screens exactly as they will appear. Horizontal and columnar data fields can be used in the same format.

All popular data types are supported. (Continued on Page 42)

According to recent reports, people who work with computers spend some 30% of their day working in their chosen profession. And 70% of their day just getting things done.

So we're announcing some ways for making better use of both sides of their day.

For starters, we've set some new standards in high performance workstations. By introducing a new set of Apollo computational nodes so fast you don't have to wait for them to figure out anything. Even when you're working on Solids Modeling, Image Analysis, Finite Element Analysis, and VLSI Design.

The Apollo DN 660 and DN 460.

Inside you'll find up to 4 MB of main memory. With full 32-bit architecture and an integrated hardware floating point unit. And enough power to handle up to 24 concurrent processes, each with up to 256 MB of virtual address space. Plus high resolution bit map graphics that among other things, can do area

fills at up to 320 million bits per second.

In other words, they've got all the power of a high performance supermini like the VAX* 11/780. Except that they sit at a desk. And go for a fourth of the price.

But even more important, each DN 660 and 460 workstation node you add to the Apollo DOMAIN network adds power instead of taking it away. Because each is a 32-bit workstation with network wide virtual memory that lets all Apollo nodes share data, software, programs, and peripherals transparently across the network.

But we've also introduced software that helps professionals work with the other side of their work: DOMAIN Professional Support Services. With Document, Mail, Calc, Calendar and File. All based on the more complex needs of the professional. And fully integrated with your application programs. So you can do all your work on the same system.

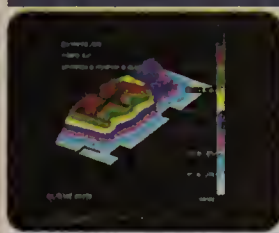
All of which should come as a very welcome development to every professional. Because we at Apollo are not simply making computers. We're making workstations that work for professionals.

For more information call or write Marketing Services Director, Dept. J1, Apollo Computer, 15 Elizabeth Drive, Chelmsford, Massachusetts 01824 (617) 256-6600, ext. 6608.

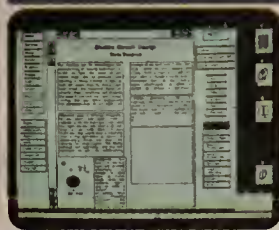
apollo

*VAX is a trademark of Digital Equipment Corporation.

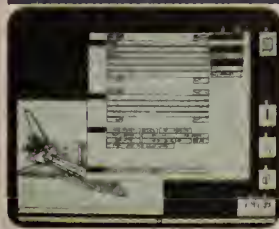
The power of a high-end 32-bit supermini at your desk for a fraction of the price.



The DN 660 and DN 460 can do state-of-the-art Finite Element Analysis at state-of-the-art speed.



They work on documents the way professionals work.



They do Electronic Mail, Filing and Calendar Management.

Remote Terminal-CPU Link Simulates Micro

(Continued from Page 41)
ported, and field attributes may even be color coded on color terminals. Format changes do not invalidate existing data. A "fill" function fills records with the required information from the data base, as defined by the user in the link file. A "find" function displays information directly from a record, again according to user definition in the link file.

The data base contains the information necessary for management of a network. Users may define any number of files to access information by keyword. The data base structure, relationships and screen formats are all defined by the user.

Query-by-example access to records and files is provided by comparison operators. The Fill and Find functions provide interfile reference

capabilities. Any number of key fields may be supported in each record.

A variety of common data base maintenance functions is also provided, Allen noted. System flow and relationships are also defined without programmer assistance, using the link and menu files.

The report writer lets users define and run reports on any aspect of the data base,

Allen said. Reports can be created using data from any number of files, with the system prompting the user through the definition of the report. The report writer may also be used to perform mass updates of the data base.

Other utilities handle system security, message communications between users, a conversion facility that converts files from other sys-

tems to the PNMS-II format, a status function that displays all current users and a journal that records all system activity with data, time and operator identification.

"The data base is structured in such a way that the casual user can set up his system without any programming restrictions or being an experienced programmer," Allen said. "The user can sit down at his terminal or personal computer and develop his own program in a matter of 15 to 30 minutes."

In addition, he noted, the user can go back in and make changes in his program without losing all the data he has already keyed in. "The integrity of the information remains, even though new records or fields may be developed. It can be reformatted to the new screen layout without redoing data entry or using a conversion program."

PNMS-II users may employ existing personal computers as remote terminals in a 3270 emulation mode to communicate with the mainframe. "In fact, the data base and our Megacalc spreadsheet program [from The Mega Group, Inc.] let personal computer users load their own programs into our mainframe and continue to use them," Allen said.

Data Sharing Easier

Communications and data sharing are easier because the mainframe "personal computer" can support up to 32 users per site. To maintain communications between remote personal computers or terminals and the central computer, Data Ten has installed protocol converters to take the Ascii asynchronous data coming in from the personal computer and convert it to the 3270 mode.

Mainframe computers were structured as transaction-driven data base with a batch orientation. These traditional designs have been modified in recent years to be interactive, but the resulting data bases have not been relational.

"The personal computer has changed all of that," Allen said. "The personal computer creates keys and pointers at the time the data is entered, so whenever data is to be retrieved, the personal computer simply goes through the same calculation to come up with the data address. Personal computers are fast in cycle time so they execute well. But they don't support large data bases because their off-line storage is limited. So this new partnership of personal computers and large CPUs gives users the best of both."

There's Only One Way To Control MVS Performance...



Duet with Duquesne

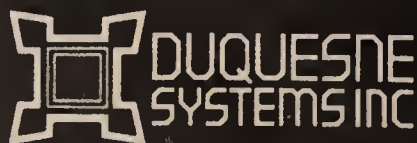
Experience and innovation. At Duquesne Systems, Inc., they work in harmony to consistently supply the products and services that make *data centers* run better. For 13 years, we have introduced and maintained performance and optimization products for MVS and VS1 systems. Our leading-edge technology and service have made us world-wide favorites among users spanning all industries. Duquesne Systems—virtuosos in the software field.

Performance Measurement—Accurate and Complete
Measurement That Makes a Difference

Shared Device Management—Improving Multi-CPU Environments

Performance Optimizers—Automatically Improving System Performance

The Quiet Leaders In System Software



TWO ALLEGHENY CTR., PITTSBURGH, PA. 15212
CALL TOLL FREE 800-323-2600/TELEX 902 803
INSIDE PA 412-323-2600

NEW
REALTIME ACCOUNTING CONTROL

NO OTHER GENERAL LEDGER MEASURES UP

We've just enhanced the industry standard, and we're confident it's the most advanced general ledger on the market.

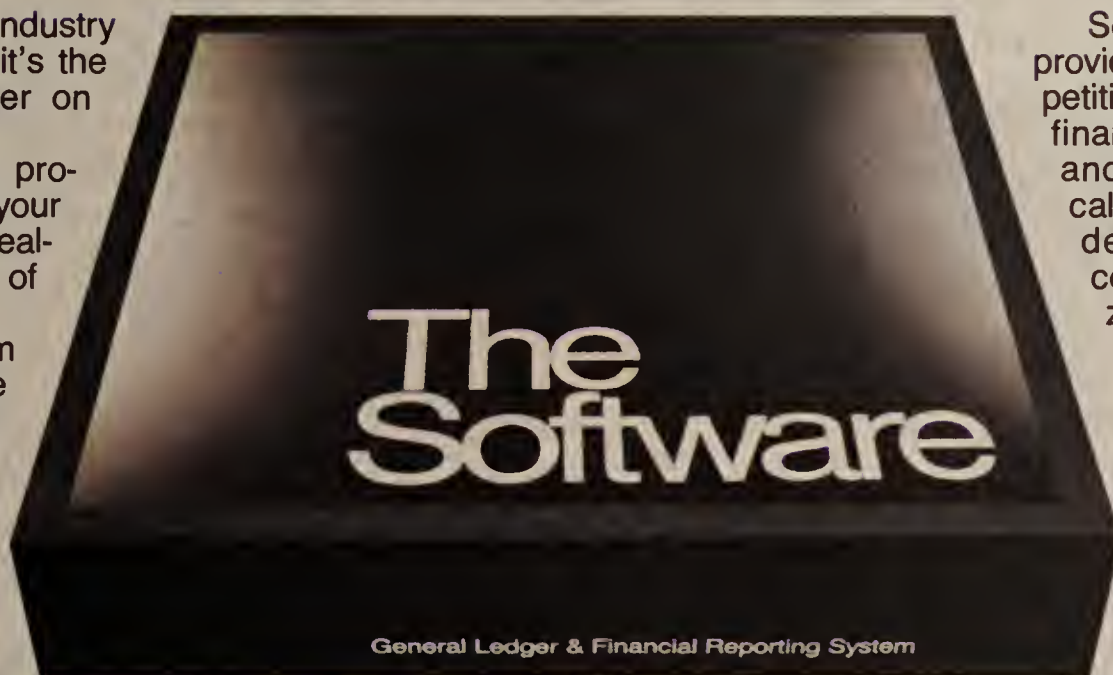
Selective Realtime ability provides precise feedback from your general ledger. Immediately. Realtime maximizes the efficiency of your accounting operations.

Comprehensive system security and audit controls are built into the system to ensure data integrity. You control who can enter, review and make changes to your financial information. Audit trails allow you to trace the source of transactions.

Our Variable Report Writer lets you design, maintain and control every report that comes out of your system. The automatic building of reporting structures allows you to rapidly address your company's reporting requirements. An extensive standard format library eliminates the need to design basic financial reports. You can also use a common format across reporting entities. No other general ledger provides as much easy-to-use reporting power and online access to information.

With our powerful online inquiry ability, you can query your financial database at a summary or detail level to immediately trace the source of a variance or an account balance.

Our package design accommodates your chart of accounts, not vice versa. You can design any account numbering system, up to a 24 alphanumeric free-format account number.



Sophisticated system architecture provides benefits not found in any competitive product. Detail and summary financial information is as accurate and up-to-date as the last physical posting to the system. System design can automatically reflect corporate changes and reorganizations in company reports.

Software International has been installing and supporting high quality financial application packages for almost two decades. Currently, our General Ledger and Financial Reporting System is hard at work for more than 4,000 of the best run businesses in the world—firms like E.I. DuPont, R.J. Reynolds and Miller Brewing. Hundreds of

Fortune 500 Companies have selected our General Ledger over the competition's. As a wholly-owned subsidiary of General Electric Information Services Company, we are part of a worldwide family of more than 5,000 computer and business professionals.

For more information, call us today. Or write our Corporate Headquarters at One Tech Drive, Andover, MA 01810. When you take a closer look, you'll see that no other general ledger measures up to ours. We're continually improving our product to stay at the leading edge of software technology, and to serve the changing needs of the business world.

After all, you don't remain the industry standard by standing still.

CONFIDENCE IN EVERY PACKAGE

CALL TOLL FREE 1-800-343-4133

(IN MASSACHUSETTS 1-800-322-0491)



**SOFTWARE
INTERNATIONAL**

UW Library Testing On-Line Card Catalog

MADISON — Few students at the University of Wisconsin's Madison campus relish the thought of a close encounter with the card catalog at the university's Memorial Library.

Confronted by drawer upon drawer of file cards containing listings for the library's 4.5 million books, students often complain that finding resource materials is by far the toughest assign-

ment of any research project.

But the university has taken the first step toward a computerized cataloging system that will someday make today's cards and drawers obsolete.

Currently in the testing stage at UW-Madison's smaller College Library in Helen C. White Hall, the new system promises to make searches for materials easier and quicker.

Students with just a vague idea of a subject heading or only part of a book title will be able to conduct a fast search using the computer, predicts Donna Senzig, acting director of College Library, which serves mainly undergraduate students.

According to Senzig, the computer will even tell the student whether the book is on the shelves or out on loan.

Installed in late June, the

College Library system contains listings for the 40,000 titles available at that library. Seven IBM 3101 terminals access information on a data base residing on the university's IBM Series/1 minicomputer.

Expansion of the system to handle 400,000 of the volumes at the larger Memorial Library is expected next spring, but is dependent upon approval of funds by

the state legislature, Senzig said.

She hopes that 50 computer terminals will be available at Memorial Library next year.

Terminals at Branches

Eventually, terminals will be available at all 22 major campus libraries, departmental offices and dormitories, making trips to the main libraries unnecessary.

"In a time of budgetary constraints, the system will provide a better way of providing service without increasing staff," Senzig said.

The "Online Catalog," as it is called, will bring important changes for both researchers and librarians, said Frank Bright, director of technical services at Memorial Library.

According to Bright, efficiency will be improved for librarians as well. He estimates that as many as 200,000 cards may be misfiled in the Memorial Library card catalog, making these books inaccessible both to librarians and researchers. "This is one of the most important things libraries must do over the next decade to meet the needs of scholars," Bright said.

Card Catalogs Out

"Card catalogs are on the way out. They've grown too large, complex and costly, and there are too many inconsistencies in them," he said.

Bright predicted that electronic cataloging will eventually eliminate most of those problems. But two familiar problems — time and money — will make the switch-over to computer cataloging a years-long process. Aside from the obvious cost of providing mainframe computers and access terminals, the university must also deal with the problem of cataloging millions of volumes that were filed on cards under outdated systems, Bright noted.

THE LATEST INNOVATION IN DATA BASE SOFTWARE. IS HARDWARE.

Microdata welcomes the other computer companies who have finally discovered that the relational data base is the most practical way to store and use business information.

It's been a decade of solitude for Microdata since we introduced a non-hierarchical data structured operating system. Together with our ENGLISH[®] retrieval language, it makes the computer accessible to anyone that can read and write.

When you organize your business around a data base, you're entering a transaction-driven environment. But most computer systems are designed for batch processing. A lot of terminals plus a lot of transactions add up to poor performance for these archaic systems.

Now, unfortunately for the catch-up computer companies, Microdata has further advanced the state of the data base art. With the first computer system specifically designed for data base management.

A few of the Microdata hardware innovations that take data base system performance to new heights are pointed out below.

To take your business computer productivity to new heights, write Microdata Corporation, P.O. Box 19501, Dept. T-208, Irvine, CA 92713.

Compatibility with other Microdata systems provides an extensive available base of application software.

Microdata's operating system occupies only 12K words of main memory. Another 64K is micro-coded in firmware, for faster operation and greatly reduced system overhead.

Distributed micro-processor architecture, bit-slice processing, and multiple system buses provide the high I/O throughput and peripheral performance essential for high volume transaction processing.

32-bit CPU features a 150ns cycle time, with the ability to support 4 MBytes of main memory and 127 concurrent on-line users.

Pipeline architecture pre-processes instructions in advance for high speed parallel processing.

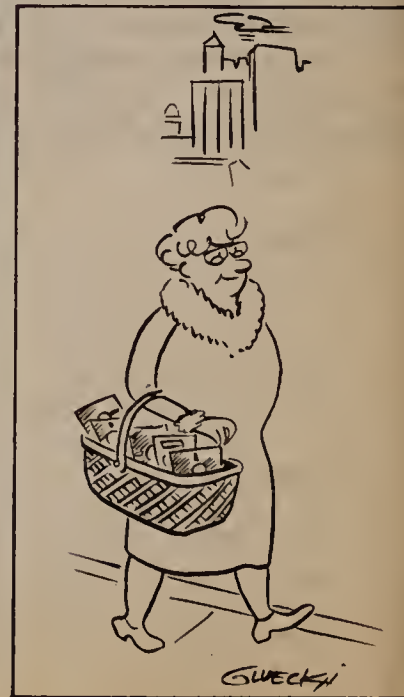


Microdata
SIMPLY POWERFUL



Microdata is a subsidiary of McDonnell-Douglas Corporation.

© 1983



Handles Variety of Applications

Petroleum Firm Strikes Oil With Local Net

DALLAS — The nation may depend on oil, but the people who search for oil depend on information.

"The lifeblood of an oil exploration firm is land to drill on," explained Joe Lannier, data processing manager for Lear Petroleum Corp. based here. "You have to keep track of the leases under your company's control."

When Lear Petroleum's accounting work load began to skyrocket, its DP department had to keep up, even though the work load increased by a factor of 20 between 1977 and 1983. The firm's business grew from \$17 million to \$200 million.

Lear Petroleum is an oil and gas exploration and gas transporting firm. Prior to 1977, the firm — which employs 350 people in Oklahoma, Texas, Louisiana and Montana — subscribed to a computer service bureau.

"We wanted applications developed specifically for Lear, but the service bureau couldn't provide that," recalled John Winslow, Lear Petroleum's vice-president for management information systems. "In shopping for our own computer, we were looking for systems that were user-friendly — we didn't want a data processing staff that would get between the system and the users."

Lear Petroleum bought in 1977 a Datapoint Corp. 6600 processor configured as a Datashare system with three attached terminals and 20M bytes of disk storage. The 6600 is a minicomputer that fits easily on a desktop, according to Datapoint. Lear Petroleum ordered one with the maximum internal memory possible — 256K bytes.

Datashare is the multiuser version of Databus, the Datapoint programming language. Up to 24 terminals running different Databus programs simultaneously can be attached to a 6600 processor.

"Not only did we grow transactionally — by the amount of accounting work we had to do — but we also grew by the number of applications we had running on the computers," Winslow said. "We needed to add about one terminal every month or so."

Initially, Lear Petroleum began running four applications — lease records, general ledger, revenue distribution and joint-interest billing. Progress, however, didn't stop there, and soon the company reached a point at which more processors were necessary.

Lear Petroleum expanded to a Datapoint Attached Re-

source Computer (ARC) local-area network in 1979 with the addition of two 6600s. One 6600 acted as a "file processor," handling the network's disk storage, and the other two acted as Datashare processors.

Network of Processors

Lear Petroleum now has a network of Datapoint proces-

sors at its headquarters, and smaller networks have been installed at three divisional offices. Seventeen of the processors are 6600s; another 17 are 3800s; and seven are 8600s. The 3800s and the 8600s are large-screen processors suitable for word processing.

Five of the 6600s are file processors, supporting a total

of 740M bytes of storage. Another five are used for Datashare, supporting a total of 38 terminals. Other network resources include four letter-quality printers, three high-speed belt printers and two 160 char./sec dot matrix printers.

Lear Petroleum now runs more than 60 application software systems on the ARC

network, ranging from payroll accounting to natural-gas purchasing. The programs are written by a software consulting firm that Lear Petroleum owns. When the programmers aren't working for Lear Petroleum, they're available to work for some other company. On the average, about 15 people

(Continued on Page 46)

The promise fulfilled.



Others talk about integrating voice and data. Now with the NEAX 2400 Information Management System, NEC makes it a reality.

An innovator in technology since 1899, NEC has long been an acknowledged leader in integrating computers and communications (C&C).

Now with the NEAX 2400 IMS comes NEC's finest expression of C&C. A system destined to become the core of the world's most sophisticated information networks during the '80s and beyond.

Unlike costly patchwork solutions to office automation, NEAX 2400 IMS is a modular system designed from its inception to economically integrate divergent

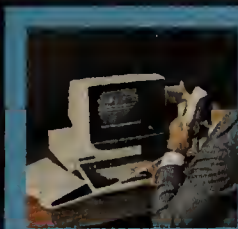
services. It can provide as a single powerful system everything from voice and data communications to advanced functions such as text and voice mail and Local Area Network.

Its unique modularity offers cost-effective operation from an

unprecedented 184 ports to over 20,000. You can start with voice communications, then add data and special services as needed, by adding compact modules.

No longer just a promise, the fully integrated office is here. Contact NEC Telephones, Inc., 532 Broad Hollow Rd., Melville, NY 11747. Toll-free 1-800-645-9836; in NY State 516-249-4511.

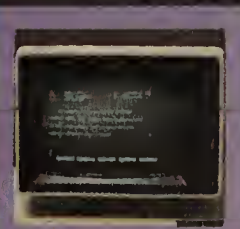
NEC NEC Telephones, Inc.



VOICE AND DATA



VOICE MAIL



TEXT MAIL



FACSIMILE MAIL



PACKET SWITCHING



LOCAL AREA NETWORK

NEAX[®] 2400 IMS

Conference to Highlight Micros

PALM SPRINGS, Calif. — Enterprise Information System, Inc.'s fall conference focusing on the use of personal computers and developments in microcomputer software will be held Nov. 21-22 at the Americana Canyon Hotel here.

Among the featured speakers at the conference will be Esther Dyson, president of Rosen Research, Inc., whose keynote address will highlight "Critical Factors for Success in the Personal Computer Arena."

IBM Director Robert Berland will present an overview of application software

developments and end-user trends, and Ralph Ungermann, president of Ungermann-Bass, Inc., will discuss local-area networking for large organizations.

According to the sponsor, the conference will highlight the growing use of microcomputers and the implications of that trend for users, vendors, OEMs and retailers.

The cost to attend the fall conference is \$850.

Enterprise Information System can be reached through P.O. Box 1154, Greenwich, Conn. 06836.

Local-Area Net Keeps Track Of Oil Firm's Land Leases

(Continued from Page 45)

work on software for Lear Petroleum at any one time. However, Lear has only one full-time DP staff member.

"With every application we do, the first thing we think about is how the user can do this for himself. All data entry, all file updating and 60% of the processing is done by the users," Winslow said. The DP staff performs

overnight batch jobs, plus file backups and other "housekeeping" chores.

Divisional offices in Denver, Oklahoma City, Okla., and Houston have been equipped with ARC networks. "The systems at the divisional offices are used for regular accounting and for tracking the number of undeveloped leases under Lear's control," Lanier explained.

The divisional ARC networks are on-line with headquarters via phone lines using a Datapoint software package called Arlink. This gives all users transparent access to the files stored in the headquarter's ARC network — except, of course, that the data is transferred at 9,600 bit/sec instead of 2.5M bit/sec. A processor at each end of the communications link must be dedicated as a "communications processor."

Word processing is done through Datapoint's Integrated Electronic Office Station software, which turns the 8600 or 3800 into a WP station. Mathematical modeling is done with Microsoft, Inc.'s Multiplan, a spreadsheet simulator.

"Multiplan has proven very valuable," Winslow said. "It's used a great deal by top management."

"The direction I want to go in is toward tying a number cruncher or mainframe to the ARC network — to be a slave of the network, not the other way around," Winslow said.

Group Formed For CLS Users

JACKSONVILLE, Fla. — TCS Software, Inc. has announced the formation of the first TCS Client Ledger System (CLS) Users Group. The organization was established to provide CLS users with details on the features and benefits of the package, to answer questions and to establish a source of information on CLS capabilities.

The chairman of the group, Robert T. Hood, is an accountant who has used the package for two years. Hood is interested in talking about problems, solutions and desires for the future with other CLS users.

The group's first meeting was held in late October. Participants included Fred Martin, author of CLS, and Tom Lytle, a CLS specialist.

More information on the organization is available from the CLS Users Group, which is located at 10695 Beach Blvd., Jacksonville, Fla. 32216.



MULTIPLE CHOICE: The UDS Modem Family

SPEED RANGE (bps)	DIAL-UP NETWORK		PRIVATE LINE		LINE POWERED	
	MODEL	PRICE	MODEL	PRICE	MODEL	PRICE
0-300	103J*	\$425			103 LP O/A 103J LP*	\$145 \$195
0-1200	202S*	\$475			202 LP 202S LP*	\$195 \$245
0-1800			202T	\$425		
1200/300	212A* 212A/D	\$595 \$645			212 LP**	\$445
2400	201C*	\$775	201B	\$695		
4800	208A/B*	\$1750	208A/B	\$1750		
9600	9600A/B*	\$2650	9600 9600A/B	\$2650 \$2650		

*Auto-answer **1200 bps only

Single unit prices.

DISTRICT OFFICES:
Old Bridge, NJ, 201/251-9090 • Blue Bell, PA, 215/643-2336 • Atlanta, 404/998-2715 • Glenview, IL, 312/998-8180 • Columbus, OH, 614/895-3025 • Boston, 617/875-8868
Richardson, TX, 214/680-0002 • Englewood, CO, 303/694-6043 • Houston, 713/988-5506 • Tustin, CA, 714/669-8001 • Mountain View, CA, 415/969-3323

COMDEX: Booth 2730

UDS Universal Data Systems

MOTOROLA INC.
Information Systems Group

Created by Dayner/Hall, Inc., Winter Park, Florida

Answers Users' Application Demands

Supermini Software Cleans Up Sassoon DP Shop

LOS ANGELES — Rapid growth in sales of its beauty products throughout the '70s placed ever-growing strains on DP resources at Vidal Sassoon, Inc., a subsidiary of Richardson-Vicks, Inc., an international hair care and beauty products organization based here.

Users came to demand increasingly more from the shop's patchwork series of homegrown applications, which were written largely in Fortran and were difficult to modify. In time, the shop fell into the rut of doing more maintenance than new development.

Sassoon's data processing specialists realized in 1981 that a clean break was needed from their existing systems, and a search for new software began. Consultants were hired to examine user requirements and audit the DP department.

With the need for new applications verified, the selection cycle began with the premise that the software should drive the hardware choice. A checklist of features and functions was drawn up for the software.

"We looked at a number of software suppliers, including large mainframe companies," said John Seddon, Sassoon's manager of systems and programming. Ultimately, Sassoon settled on Los Angeles-based Computer Data Corp.'s financial applications running on two Hewlett-Packard Co. HP 3000 Series 44 superminicomputers. Seddon said the selection was based on the system's on-line capabilities.

On-Line Transaction Editing

Of particular appeal was Computer Data's standard transaction file structure, Sila, which allows data entry to a standard format and provides the capability to edit transactions on-line then update immediately or off-line overnight. This contrasted with Sassoon's in-house system, which required batch data entry to disk and an overnight update remote from where the documents originated.

Why wasn't a mainframe chosen? The software on a superminicomputer turned out to be sufficient functionally, and the two HP 3000 Series 44s were capable of handling Sassoon's volume requirements, Seddon said.

"I find it hard now to distinguish between minis and mainframes," he added. "I used to work for IBM, and in retrospect I can't understand why I got so involved in all that complexity. Those IBM customers that I have visited are doing the same kind of things we are, but they have a huge overhead in terms of specialized data processing experts."

Installation of the applications began in March 1982. In preparation for the conversion from Sassoon's older hardware, a Data General Corp. Eclipse C/350, the DP staff wrote data conversion programs that included the capability of entering data only once while running in parallel. The staff produced a tape on its Sila batch and ran the data through the normal transaction processing to ensure that it was clean.

The general ledger and accounts receivable systems were brought up first and ran in parallel for three months. When manual balancing was performed to verify processing, the two balanced to within a penny.

After Sassoon was confident of the results from the general ledger and accounts receivable applications, the accounts payable was implemented.

Today, 40 terminals are connected to one of the HP 3000s and 20 terminals to the other machine. Approximately 3,000 vendors are maintained in accounts payable, with over 6,000 customers in the accounts receivable system. Sassoon's order entry system still runs on the Eclipse.

"I find it hard now to distinguish between minis and mainframes. I used to work for IBM, and in retrospect I can't understand why I got so involved in all that complexity. Those IBM customers that I have visited are doing the same kind of things we are, but they have a huge overhead in terms of specialized data processing experts."

Sassoon uses an open-item approach to accounts receivable processing.

Disputed items and unsettled claims, for instance, can be excluded from processing so that their aging is truly representative. Cash is applied to individual items, while the items placed into disputed and unsettled claims do not age.

"It's much more evident what's going on — where the data's going," Seddon observed. Batch files can be examined on-line, and source entries exist that tell users exactly where the transactions originated. Since batch records are entered and can be corrected on-line, "users really feel that they own the data and are maintaining it. They have more control today than in the past."

macs.
Since 1969,
No. 1 in
software
testing



WE MAKE SOFTWARE HEROES™

We set the standard in software testing...and deliver the tools that are enabling thousands of user organizations throughout the world improve software quality and increase productivity.

- **DATAMACS**/industry's most widely used automatic test data generator
- **Test Plan Training**. Give us a morning and we'll show you how to cut development costs 20%; free up to 80% more time of your maintenance staff

- **TRACMACS**/program path auditor that assures 100% testing
- **Testing Standards**, developed in concert with our users, and being proven daily by Big 8 accounting firms, IEEE, QAI, DPMA and hundreds of quality-conscious users

macs.
In 1983,
No. 1 in
software
estimating

In less than one year, **ESTIMACS** has established itself as the most widely used macro estimating tool in the data processing industry. Widely acclaimed as the only trusted macro estimator, it is

helping organizations accurately, reliably estimate new development and system maintenance workloads — especially helpful in package installations, make-or-buy decisions, and long-range planning.

macs.
For 1984,
the best new
idea in software
project
management

Introducing **PROJECTMACS**, the industry's first and only knowledge-based project management system for phased software development. The logical follow-on to **ESTIMACS**, **PROJECTMACS** is a unique systems development tool for knowledge-based micro-phase

estimating, expert project planning and scheduling, and distributed project tracking and control. A dramatic step forward in the automation of the software development life cycle and project management tasks, **PROJECTMACS** goes far beyond any traditional project control/accounting system.



macs/management and computer services, inc./great valley corporate center/valley forge, pa 19482/215-648-0730

a division of Pentamaton Enterprises, Inc.

FREE FALL SEMINAR SERIES

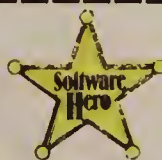
- I would like to attend your
- ☐ Morning Seminar on Test Plans
 - ☐ Afternoon technical presentation on **ESTIMACS** and **DATAMACS/TRACMACS**

- (check city)
- ☐ Boston, November 30
 - ☐ Newark, November 29
 - ☐ Pittsburgh, November 16
 - ☐ San Francisco, November 16
 - ☐ In-House

- ☐ I am interested in attending a seminar in _____ (city)

- ☐ Send me information on the Winter Seminar Series (January-March 1984)

Call 800-523-0669 (in PA, 215-648-0730) to enroll today (attendance limited)



Be a Software Hero!

Please send me information about your software:

- ☐ **DATAMACS** Automatic Test Data Generator
- ☐ **TRACMACS** Program Path Auditor
- ☐ **ESTIMACS** Interactive Estimating System
- ☐ **PROJECTMACS** Project Management System

Name _____

Title _____ Phone _____

Company _____

Address _____

City _____ State _____ Zip _____

CPU/OP Sys _____ DBMS _____

- ☐ Please send me my own Software Hero badge.

CW1114

At 112-Year-Old Distribution Firm

Hardware Firm Stays Current With T/S Service

ATCHISON, Kan. — When you mention hardware to John Mize, more than likely he'll start talking about nuts, bolts and doorknobs. But as president of Blish-Mize Co., a large hardware distribution firm based here, Mize does have more than a passing knowledge of computer hardware and its operation within a business environment.

Blish-Mize has grown steadily since its founding in 1871. A member of the PRO Hardware merchandising group, the company operates two warehouses with a total of 235,000 sq ft and does all its own deliveries with a fleet of tractors and trailers. John Mize is a fourth-generation de-

scendant of one of the firm's founders.

Mize fills orders and maintains his business with the help of a time-sharing service, Distribution IV, provided by Informatics General Corp.'s Management Systems Division in Columbus, Ohio. Distribution IV offers integrated information management systems for inventory, merchandising, retail customer services and financial applications, with minicomputer-based distributed data processing capabilities designed especially for distribution businesses such as Blish-Mize.

The time-sharing service's off-site processors interact with Blish-Mize's

in-house Harris Corp. 1625 minicomputer. "With 35,000 inventory items, approximately 1,800 customer accounts, 200 employees — including a network of 50 dealer service representatives in the field — and a lot of nickel-and-dime transactions flowing through, it's hard to imagine what we'd do today without this computerized support service," Mize said.

Mize claims the system has helped the firm boost its annual sales from \$12.5 million in 1972 to more than \$30 million in 1983.

Blish-Mize was one of the first firms to sign up for Distribution IV back in 1969. The 112-year-old dis-

tributor is presently turning its inventory about four times a year; the company's objective is five.

"Our company serves seven states fully," explained Mize. "Because of this diverse geography, we must carry a wide range of inventory. For example, in Colorado there is the tourist industry; in Oklahoma, the oil fields; in Arkansas, there is some mining; through Kansas, Nebraska and Oklahoma, we're into agriculture heavily. We are known for our breadth of inventory, and we rely heavily on Distribution IV to help us manage this wide product mix."

User Input Substantial

One of the services of Distribution IV, the Automatic Back-Order System, was designed with substantial input from Blish-Mize and is still used extensively by the company. "It has been a real labor saver," Mize stated. "We also use the Direct Order Entry System to collect all orders and have saved much time and money by reducing the amount of mailing expenses and keypunch input."

The Order Scheduling System, also provided by Informatics, is particularly vital to day-to-day operations at Blish-Mize. As with the Direct Order Entry System, order scheduling is handled in Atchison with the Harris minicomputer connected to the Informatics Data Center in Columbus. Because of the large geographic area served by Blish-Mize, the firm places high priority on handling orders quickly. The Order Scheduling System allows the firm to program its work load through the warehouse, Mize said.

"Our data processing people arrive at 4 a.m.," Mize explained, "and by 6 a.m., we have 95% to 96% of the orders ready to be processed that day. Using the Order Scheduling System, we then batch those orders and process them through the warehouse in accordance with delivery schedules. The first orders processed go into trailer one; then we start on the second trailer with the next orders in line."

"One of the greatest benefits of this system," Mize said, "is that warehouse personnel can program their work load for the day and shift resources to heavy-demand stations as necessary."

WHAT THE HECK IS AN EXECUTIVE WORKSTATION?

A lot of people have the wrong idea of how you should use a personal computer. And fancy phrases like "executive workstation" only hide the benefits of personal computing under a cloud of tech-babble.

The fact is, instant information and a computer on every desktop don't always mean bigger profits and more efficient workers.

Because when "non-computer people" use personal computers in business, the *software* they use is always more important than the hardware that's used with it.

But sometimes this software's just too hard to use, or can't do the job. Or it's already out-of-date. All of which confuses the same people it should be helping. We'd like to clear up some of that confusion.

THE CONTEXT MBA™ IT TURNS EXECUTIVE WORKSTATIONS INTO "EXECUTIVE THINK-STATIONS."

The Context MBA is software that lets you use the personal computer as a creative tool for better business decisions.

We've combined the five most useful business functions of all personal computer software - electronic spreadsheet, graphics, information management, report writing, and communications - into one easy-to-use, *integrated* product. Designed for businesspeople, not programmers.

This means you only need one software package to make your personal computer do everything it was designed to do in the first place. And then some.

TURN BUSINESS DATA INTO BUSINESS INTELLIGENCE. INSTANTLY.

By building five major functions into one software package, the Context MBA helps you to make better decisions from the large amount of data that's unique to your business.

With the MBA, for instance, you can connect a personal computer to your company's main computer to retrieve business information. Like

sales figures, operating expenses, or product reports. In minutes.

Store, edit, sort, or modify this information on your personal computer and use the MBA's electronic spreadsheet to create a "model" of your business. Develop plans and forecasts in a fraction of the time it would take to do them by hand, or by using a single-function software package.

While using the MBA's spreadsheet function, you can instantly graph and chart vital figures on the same screen. So, as you make cost or revenue assumptions, you can see immediately how the result would affect your business - this year, and five years from now.

And when you've made your decision, use the MBA's executive report writer to put words, numbers, and graphs together in a clean, printed report.

It doesn't take a computer to tell you that this kind of control over business facts, figures, and alternatives gives you an edge on the competition and a head start on each new day.

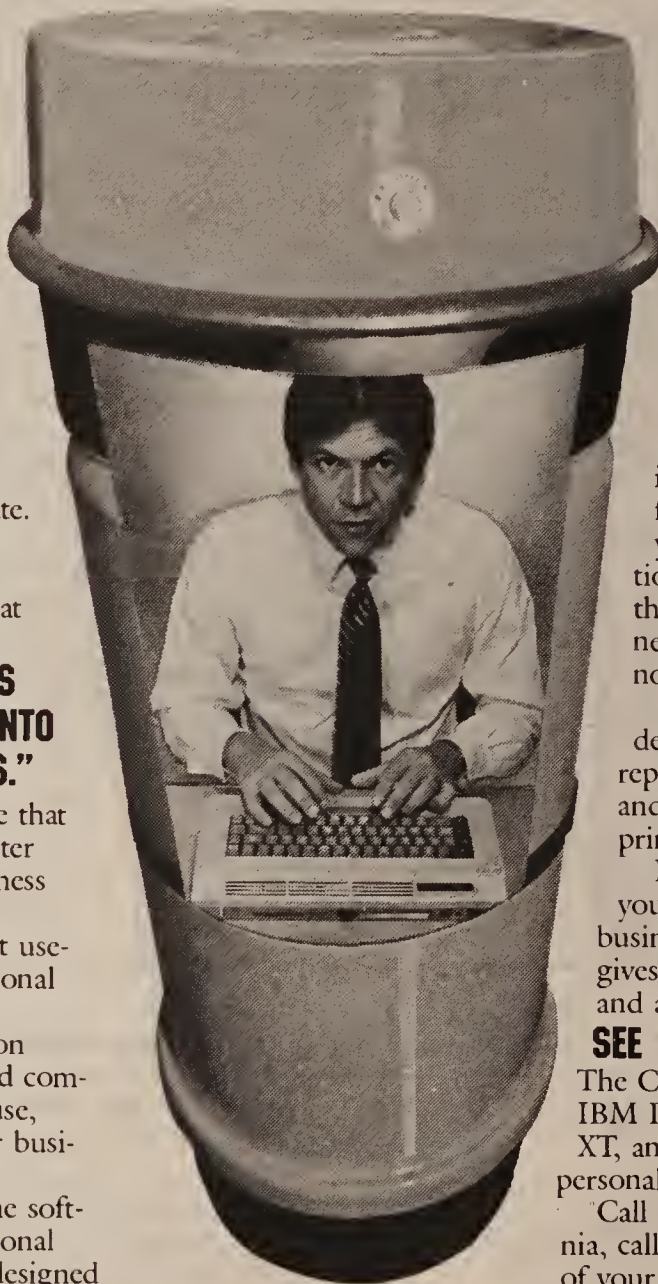
SEE IT NOW.

The Context MBA can be used on the IBM Personal Computer, the IBM PC-XT, and the Hewlett-Packard Series 200 personal computers.

Call us at 1-800-437-1513 (in California, call 1-800-592-2527) for the name of your nearest Context MBA dealer and a copy of our tell-it-like-it-is brochure, *Software Explained*.

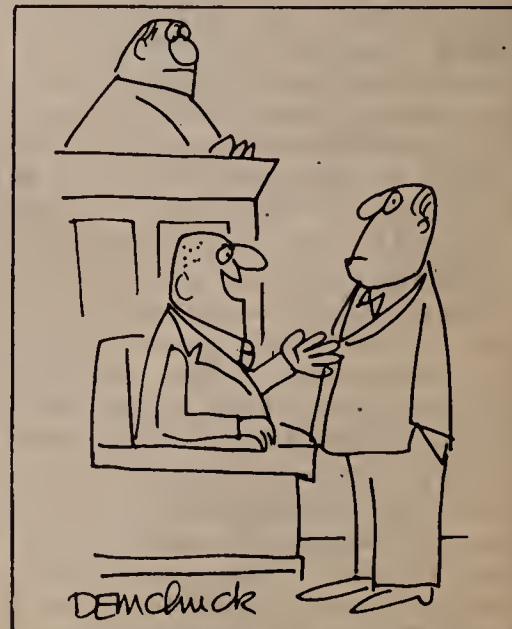
If you have an IBM PC, we'll also be glad to send you a free copy of our Context MBA Sampler Disk that gives you a live demo of the MBA.

CONTEXT MANAGEMENT SYSTEMS
23868 Hawthorne Blvd.
Torrance, CA 90505 (213) 378-8277



Context
MBA™

Personal Computer Software for Business Decisions.



I Switched From Mugging to Computers Because I Wanted to Better Myself.

Introducing the only computer tape certified error-free at 6250 CPI



GRAHAM ULTIMAG[™] THE ULTIMATE IN MAGNETIC COMPUTER TAPE, is manufactured on Graham's new state-of-the-art coating line. Each reel is then independently full-length certified error-free at both 6250 CPI and 1600 BPI on the Qualifier* (Graham's new advanced technology certifier). This new and revolutionary product is the culmination of many years of extensive research, planning and investment by Graham Magnetics, the industry leader in computer tape technology.

Innovative production procedures are used to produce Graham Ultimac and one of the results is a less abrasive tape — that means a minimal amount of headwear.

Graham Ultimac has a patented binder system which will not suffer adhesive/cohesive failure under normal use. Internal testing proves it will even withstand storage at 120°F and 100% relative humidity for 2,500 hours without deteriorating.

The Graham Ultimac warranty indicates the confidence Graham has in Ultimac. If a tape fails due to workmanship or material defects, Graham will replace it. Should adhesion/cohesion failure occur, Graham will reimburse the user for data reconstruction costs up to \$5,000.**

At Graham Magnetics, superior products and superior service go hand-in-hand . . . because you can't afford anything less.

The Magnetic Media Company Graham Magnetics

Graham Magnetics Incorporated
Subsidiary of Carlisle Corporation
6625 Industrial Park Boulevard
North Richland Hills, Texas 76118

CARLISLE

[™] A trademark of Graham Magnetics Incorporated.

*Patents Pending.

**Per terms of the published Graham Magnetics warranty.



See us at COMDEX/FALL '83, booth A-213.

Workstation Rules Out Paperwork for Court

FAIRFAX, Va. — It hasn't replaced the gavel as a judicial symbol, but a computer workstation has become a fixture in one courtroom. It operates as part of a system that has reduced paperwork and improved accuracy and efficiency in the Circuit Court operation here.

Prior to automation in the late 1970s, the court clerk's office was overburdened with paperwork. Frequent interruptions prevented clerks from recording and filing important documents in a timely fashion, according to Circuit Court Clerk James Hoofnagle. "Employees were constantly thumbing through files to answer questions from the public, which meant they didn't have time to do their filing job," he recalled.

In September 1976, the Fairfax County computer staff and the 19th Judicial Circuit Court began general design work on a series of six applications packages. Those applications were to be run from the county mainframe, an IBM 3031. The first of those packages went on-line in October 1978, the last in January 1981. The six packages include jury management, civil case management, criminal case management, records indexing, automated land records and civil and criminal service.

Terminals Purchased

Twenty-five IBM 3278 terminals were purchased to communicate with the county mainframe, running under CICS. Also purchased were two IBM 3278 printers, according to Circuit Court Management Analyst Shirley Buckley.

Prior to the automation project, Buckley was deputy clerk of the court. Selected to work on the application design project, she eventually became a liaison between the county programming staff and the clerical end users. Over the past six years, Buckley has moved from a primarily end-user orientation to one acutely aware of DP needs.

With automation, court employees have succeeded in erasing the backlog of work and have stayed on top of it ever since, Hoofnagle said. "We do today's work today." Even Chief Circuit Judge Barnard Jennings uses a display terminal — to check quickly judicial orders and other crucial details that can have a bearing on cases before his court, according to a county spokesman.

The system is the reason that clerks have been able to handle a 46% work load increase during this period,

even though the staff has only grown 22%, Hoofnagle said.

Training Not a Problem

Supervised in-house, training was not a problem. Buckley, who was in charge of the training effort, estimated it took about two weeks of training before the staff was able to take over. "The system was really very easy to utilize. As a result,

most work was reduced by a minimum of 50%," according to Buckley.

Workers are now able to research questions from their desks, using display terminals to find answers quickly, which in turn gives them more time for other tasks. Also, they are able to process documents faster, indexing 830 land records one day recently. Court personnel agree that the IBM system

has saved them an astronomical amount of time, according to Hoofnagle.

Accuracy — a critical element in the court's record-keeping operation — also has been enhanced, Hoofnagle said. The system prevents errors by alerting clerks to mistakes through a flashing workstation screen. Further, "The computer is a great security tool for us. We have thousands of files, and if one

of those is ever misplaced, we wouldn't lose it because it's on the computer," Hoofnagle said. The court also maintains hard-copy backup, he added.

"Another fascinating feature of the system is that it allows several other agencies in the county to access our records via their terminals, rather than have to make a special trip or pick up the phone," Buckley said.

**TISTM WINS
INDUSTRY'S
HIGHEST
TECHNOLOGY
AWARD.**

Off-Loads 95% of Data Entry

Mini Helps Manufacturer Integrate Operations

BRAINTREE, Mass. — A user-oriented, on-line minicomputer system has helped a component manufacturer here integrate manufacturing and financial operations and off-load 95% of its data entry to end users.

Sigma Instruments, a division of the Wheelabrator-Frye Corp., is a manufacturer of electrical and mechanical

components that employs 1,200 workers. Its diversified product line of more than 7,000 items ranges from relays to stepping motors. Its operating facilities include the main plant here and several warehouses and assembly plants located in Connecticut, Mexico, Puerto Rico and Canada.

Based on his experience in

developing the turnkey system, Sigma DP Manager Paul Meallo had some advice for companies about to embark on a computer project. "The first step should be to define clearly the goals and philosophies behind the implementation of the system. The second step is to find a software company who will work with you to achieve those

goals," he said.

Change Philosophy

For 15 years, Sigma's financial and manufacturing information was processed on an IBM 360. In 1978, management decided it was ready to change both the system and Sigma's DP philosophy. It wanted to move from IBM batch mode to a more ef-

ficient, on-line, interactive minicomputer system. The goal was to separate the various data bases to create maximum opportunity for growth while running on a turnkey system. Also, the decision was made to break the company into divisions by product line. Each area was to have DP capabilities in addition to its own engineering and administrative capabilities.

The criteria for the new system included a user-oriented approach and the ability to integrate manufacturing and financial operations. Aware that the system transition would be lengthy, Sigma also wanted a software company that would provide the necessary commitment during the process of accurately implementing and customizing a system.

After talking with a number of vendors, including IBM, Sperry Corp. and Burroughs Corp., the firm decided that Digital Equipment Corp.'s Datasystem 11/70 minicomputer and TEC Computer Systems, Inc.'s Manufacturing System Software could provide the right solution for Sigma.

"We chose TEC because we knew they were specialists with manufacturing systems, and we felt very comfortable with the company," Meallo said. "With larger companies, you can spend half your time caught up with a lot of red tape. We knew we would be more in touch with TEC's upper management if we had needs," he added.

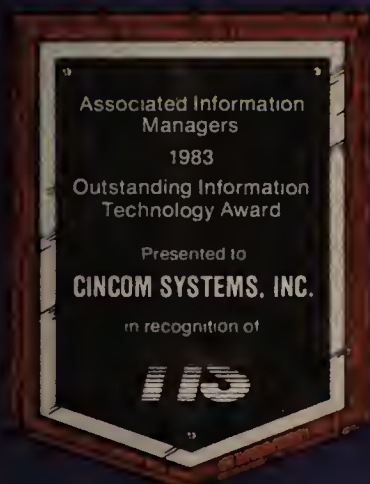
In addition, Sigma opted for "plain-vanilla" software. "With this package, you define your requirements and build the applications to suit your needs," Meallo said.

User Involvement

Begun in March 1981, Sigma's approach to system implementation stressed the importance of involving the users as much as possible in the process of defining the company's requirements. A project coordinator was selected from each division and for each application area

(Continued on Page 52)

TIS



Heralding it as an entirely new generation of interactive data base software, the prestigious Associated Information Managers (AIM) has named Cincom's TIS winner of its Outstanding Technology Award for 1983.

data base software. And it's indicative of TIS' wide acceptance by senior data processing managers and MIS directors, who seek leading edge information technology that represents a long term solution.

Fully operational, with thousands of applications now running in both the Development Center and the Information Center environments, TIS gives corporations one powerful system that meets virtually all corporate, departmental, and individual information system needs.

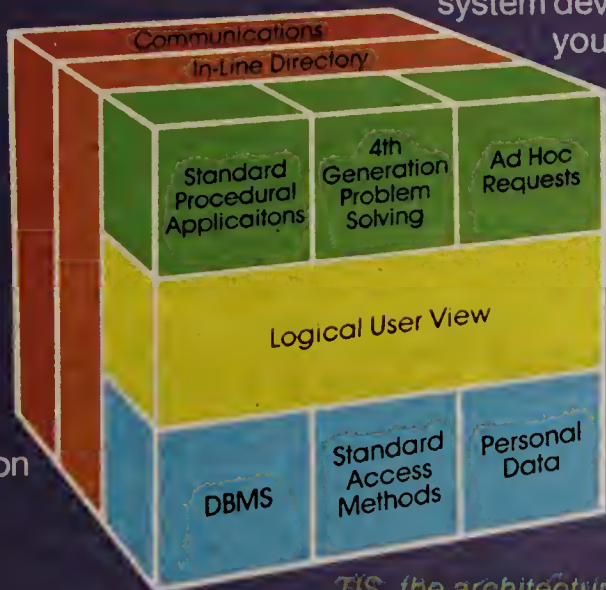
At Cincom, we believe TIS represents a generation of proven-in-use, interactive data base technology that's years ahead of any other software product. And we're pleased that AIM concurs.

But don't consider TIS just because it wins awards. Choose it because of the dramatic productivity gains TIS is achieving for major corporations worldwide. And because you want the most advanced new information system development technology for your organization.

For more on TIS, contact our Marketing Services Department, 2300 Montana Ave., Cincinnati, OH 45211, or call us direct.

800-543-3010

(In Ohio: 513-661-6000)
(In Canada: 416-279-4220)



TIS, the architecture of the next generation of integrated data base technology



Cincom Systems

TIS is a trademark of Cincom Systems, Inc.

VAX/VMS

ON-SITE COURSES

- TIMESHARE USER
- FORTRAN PROGRAMMER

Call toll-free for detailed course outlines. The cost is \$3700 per week.

Walter Gallant

Mini & Micro Edu. Services
(800) 824-7888 ext. M4573

Firm Integrates Operations With Aid of Mini

(Continued from Page 51)
in the firm to work with the project leader from TEC.

Together they reviewed TEC's package and determined the specific enhancements that would be needed. TEC then implemented and tested the enhancements in-house before installing them at Sigma.

The manufacturing applications installed at Sigma are: inventory control, bill of

materials, material requirements planning, production control (job costing and scheduling) and purchasing.

Financial Applications

Financial applications include order entry and invoicing, accounts receivable and accounts payable. TEC's Password Security Systems and English (a nontechnical data retrieval language) were installed.

Updated system documentation was also provided for approval. The next step was to demonstrate the capabilities of the modified system and get user acceptance at Sigma. The training phase took place prior to the software implementation to enable personnel to make immediate efficient use of the system.

The transition to the development environment was

easily made by Sigma's DP staff. Soon after the installation of the 11/70 system in January 1981, which included 42 DEC VT100 terminals and four LP11 printers, the staff was able to transfer a selected subset of its existing IBM programs to the DEC Datasystem, Meallo said.

This was accomplished with the RPG conversion utility provided with the system. The on-line program

development capability and complete documentation has allowed for an increase in programming productivity, and the DP staff now has the ability to respond quickly to users' needs.

Correctability and compatibility are two features that have aided both management and users more than they had anticipated. The TEC System automatically checks the validity of data as it is entered. Because all transactions are verified immediately, the system saves time, effort and money.

RTC Seminars For Programmers Using System/38

NORTH ATTLEBORO, Mass. — RTC Systems, Inc. recently announced two seminars for professional programmers using the IBM System/38.

A five-day Intensive Applications Seminar is reportedly designed to promote immediate productivity on the System/38 and includes instruction on creation of a data base, creating display device files and subfiles, RPG-III and control language programming and interactive data base utilities. Scheduled for Dec. 12-16 here, the seminar is limited to an enrollment of 12 and is priced at \$695.

A three-day RPG-III Structured Programming Course is reportedly designed to develop and expand the technical skills of the RPG programmer. It assumes prior knowledge of RPG-II and will be addressed only to the enhancements of RPG-III programming.

Scheduled for Dec. 6-8 here, the class is limited to 12 students and is priced at \$495.

Further information is available from RTC Systems Educational Center, 49 Plain St., North Attleboro, Mass. 02760.

So what's a few inches of bad tape?

"Tape's tape," you say.

That's true unless the tape you write on now can't be read later. Then things could get really hung up.

Sure, tape's the last thing you want to think about; but it's often the first thing you hear about when things go wrong. So start off right.

With Memorex®

Every inch of Memorex computer tape is tested to give you the greatest data security. And while some companies scrape away imperfections—calling it "certification"—we'd rather reject them. To keep you on the safe side.

Now Memorex has two newly formulated tape products that take our well-known quality a step further. Both are engineered for durability and

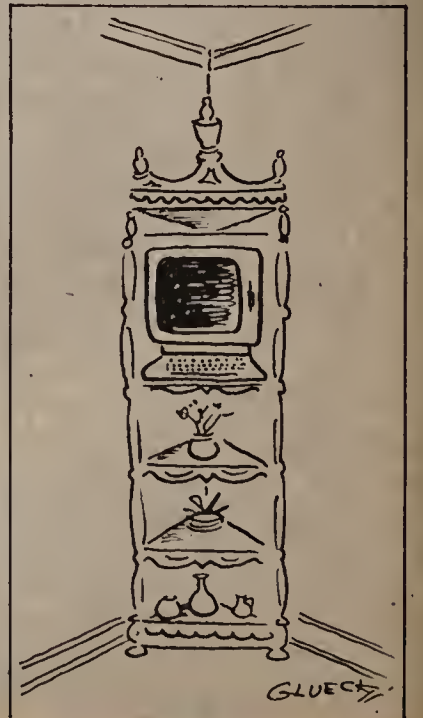
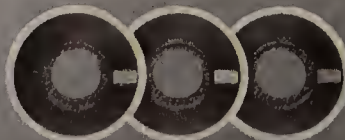
dependability in the critical 6250 bpi and 1600 bpi worlds. And each is backed by a 25-year warranty.

QUANTUM®11. Our new premium tape features higher output and that extra margin of safety for your critical data. It's write/skip free at 6250 bpi.

MRX®V. The new high-output, multi-purpose tape provides excellent value and dependability.

Don't take chances with your data. Trust it to Memorex Tape. We won't leave you hanging. For more information, call 800-222-1150.

MEMOREX
A Burroughs Company



With CICS Program Development Tool

Chemical Firm Discovers Productivity Formula

IRVING, Texas — An on-line interactive CICS program development and query system has reportedly delivered the right formula — a 500% productivity boost compared to writing programs in Cobol — to NCH Corp., a large chemical sales and manufacturing company here.

NCH found the successful formula in March. Before that, explained Bill Stivers, manager of systems development at NCH, "A major problem we faced was the need for the productivity of our on-line transactions. We had a partially interactive CICS development system in-house for a year and a half [Informatics, Inc.'s Trans IV], and during that time we became convinced that the additional capabilities available in an interactive development language would be one way of reducing our development time and costs."

After looking at the range of products available on the market, NCH chose a package called Gener/OL from Pansophic Systems, Inc. of Oak Brook, Ill. "We felt that Gener/OL was superior," said Charlie McCarthy, NCH's vice-president of data processing. "It could handle approximately 95% of the CICS transactions that we had to write, while the other system was only handling 60% to 70% of those transactions."

Moreover, McCarthy said, the Pansophic product was much more resource-efficient than Cobol. "I think Gener/OL only uses 40% of the CPU cycles that the other product was using and only 60% of [I/O] calls," he said. "We found the transactions that the average CICS programmer can write using Gener/OL are as efficient as those that a CICS command-level Cobol programmer was writing."

"From inception to delivery, the average command-level Cobol pro-

gram takes about three to four weeks. Under Gener/OL, the same program takes about three to five days," McCarthy noted.

'Completely Interactive'

Stivers believes the most beneficial aspect of the Gener/OL system is that "it's completely interactive in the coding phase. It checks syntax as you enter statements; in debugging, it tells you at which statement your transaction blew up; and it does not require a core dump. This saves a lot of time and does not interrupt the mental process of coding."

About eight people on Stivers' staff are now using Gener/OL exclu-

sively. "We have observed across-the-board results," he said.

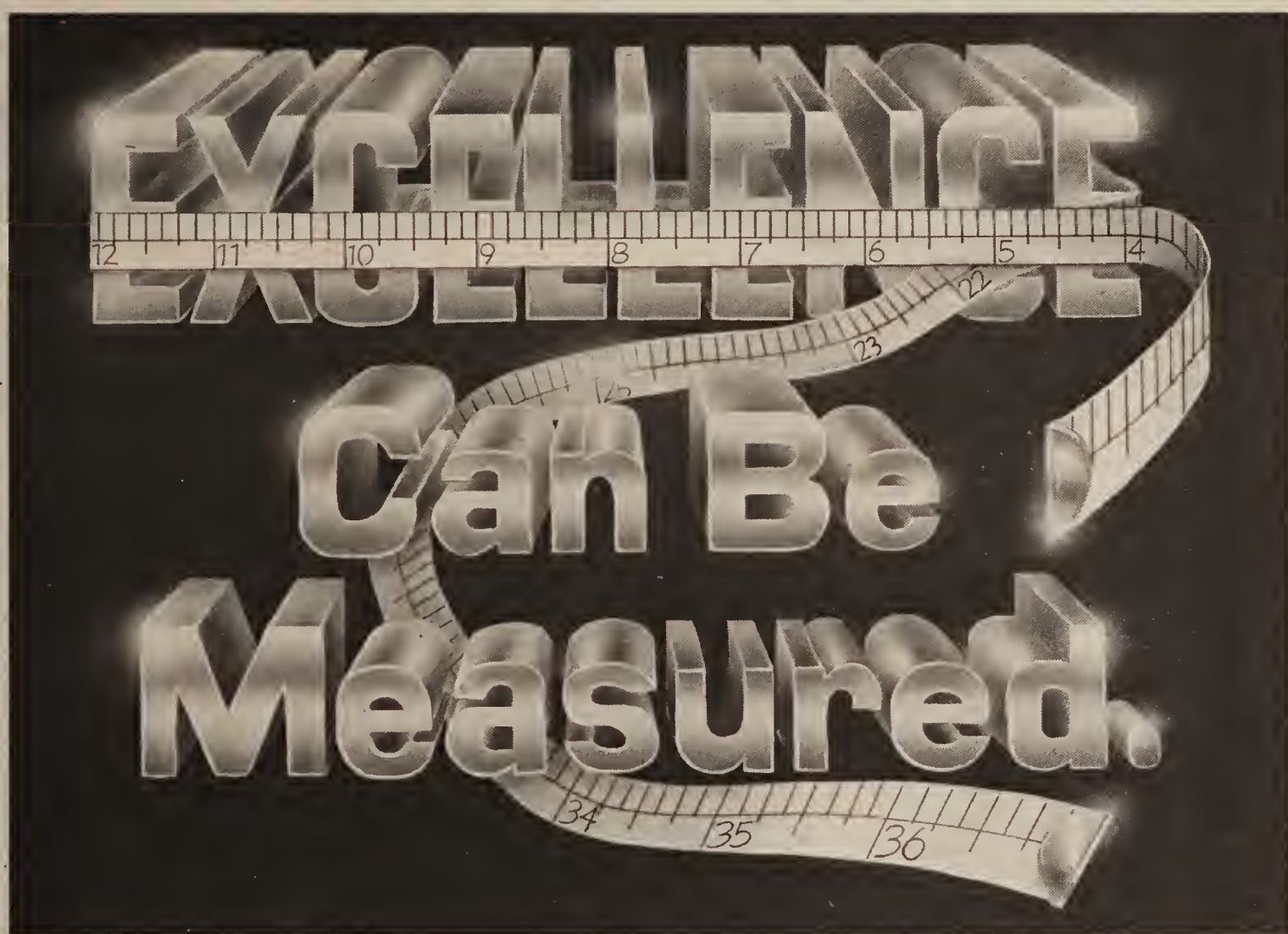
"We came up with a ratio of 5:1 in writing Cobol programs vs. the time that is required for writing the Gener/OL programs. This ratio assumes a fairly complex program that can be written in both languages," Stivers maintained.

Both McCarthy and Stivers said that Gener/OL was easy to learn. "We have recent college graduates using Gener/OL," McCarthy said. "They have data processing backgrounds and are finding Gener/OL very easy to use and similar to languages that they learned on micros at college."

Stivers continued, "The average person on our staff took a half day to a whole day to learn Gener/OL to the point where he could write a simple transaction. The staff's acceptance of Gener/OL was very good."

So far, Stivers' staff has completed a legal contract system, an electronic mail system and a job for the order department that enables them to review orders more easily.

"We have also done a mailing program, which is basically an inquiry system that can select and produce mailing labels for a region. We are also going to do an employee accounts payable system with Gener/OL," Stivers noted.



Here's How You Measure It In Financial Applications Software

Fixed Assets ■ Accounts Payable/Purchase Control ■ General Ledger

You demand excellence from your financial applications software, but it's hard to measure when you're evaluating new packages.

At Data Design, we measure excellence four ways:

- By **service and support**, and ours has been rated by independent surveys as the best in the business. That's because we use only experienced professionals who know that you need fast response.
- By **productivity**, which requires systems designed the way we design them—easy to implement and use, yet flexible enough to meet all your needs.
- By **customer satisfaction**, which we achieve with problem-solving systems that are kept up-to-date with regularly released enhancements.

- By **results**, which we let you measure by giving you a complete customer list, not just a few handpicked references.

Of course, the best measure of excellence in software is the excellence of the company behind it. When you get to know Data Design, you'll understand why we provide the best support in the industry and why we design excellence into our Fixed Asset System, Accounts Payable/Purchase Control System, and our new General Ledger System—all written in ANSI COBOL for medium to large-scale computers.

See how well we measure up to your needs. Call us at (408) 730-0100 from inside California or toll-free from any other state at (800) 556-5511.

Please send information on the following Data Design software:

- ☐ Accounts Payable/Purchase Control System
- ☐ Fixed Assets Accounting System
- ☐ General Ledger System

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

Phone _____

Mail to: **Data Design Associates, Inc.**
1279 Oakmead Parkway,
Sunnyvale, CA 94086.
(800) 556-5511

DATA DESIGN ASSOCIATES

DPMAEF Board Elects Deken

PARK RIDGE, Ill. — Joseph G. Deken, author of *The Electronic Cottage* and *Computer Images: State of the Art*, has been elected to a three-year term as a member of the board of regents of the Data Processing Management Association Education Foundation (DPMAEF).

Deken is assistant professor in the Department of General Business and the Department of Computer Science at the University of Texas at Austin. He earned a B.A. in physics in 1970 from Washington University, St. Louis, and a Ph.D. in statistics in 1976 from Stanford University. From 1979 to 1981, Deken was a National Science Foundation mathematical sciences postdoctoral research fellow at Stanford.

The DPMAEF is dedicated to enhancing educational opportunities for information systems professionals. The nonprofit organization was established to meet the changing educational requirements of the information processing profession and industry. The DPMAEF is located at 505 Busse Highway, Park Ridge, Ill. 60068.

Mini Helps Children's Home Handle Reporting

BETHLEHEM, Pa. — Installing customized software and a new mini-computer system has enabled the staff at The Wiley House, Inc. here to concentrate on helping children instead of shuffling papers.

Wiley House is licensed to perform 16 types of programs for disturbed and distraught children at its main campus. In 1980, the institute's staff found itself increasingly buried under reports and evaluations required to maintain funding for the various programs.

John P. Peter, executive director at Wiley House, recalled the situation he faced in 1979 when the requirements to obtain funding became increasingly complex. "The increase in regulations came at a time when we were considering an expansion to handle more children at our six locations throughout Pennsylvania's Lehigh Valley. We had to decide whether to add more professional staff, with a consequent higher salary burden, or to cut back on child enrollment so the current staff could properly handle the increasing administrative work load. The last thing we wanted to do was turn children away."

Over 7,000 Children Served

The institute takes its name from James Wiley, a retired sea captain who first purchased the site in the 1880s to establish a children's home. Since that time, the house has served more than 7,000 children. The pace has picked up in the last nine years, according to Educational Services Director Richard Babyak, who pointed out that 1,000 children will probably be served this year alone.

According to Peter, "We knew we would have to get into data processing. There really was no choice. If we didn't automate, we would probably go under. At the very least, we could forget about increasing our enrollments."

The institute's staff began looking for a system to suit its needs. After attending a computer fair in Philadelphia, staff came away impressed with the equipment and the services from Wang Laboratories, Inc., Peter said. Wang visited the Wiley House to evaluate the needs of the institute and later returned with a proposal built around a Wang 2200 MVP mini-computer with 256K bytes of memory, six terminals and five printers.

Applications software was obtained from The Office Manager, Inc. of Seattle and customized to the institute's specifications by the Technic Corp. out of Scranton, Pa. According to Babyak, the institute knew exactly what it wanted and chose the more expensive alternative of having software customized rather than buying

it "canned." The principal data processing operations are known as "Individual and Group Therapy with Full Automation" and "The Wiley House Data Communications Program of Psychiatric Treatment and Special Education."

The Wang 2200 MVP came on-line at Wiley House in early 1980. It ran in tandem with the manual way of doing things for the first six months. The results since the conversion have been impressive.

The system was designed for the central office staff. "We had one person who had some experience with computers, but not much, and none with Wang," Babyak recalled. "All the people in the office picked up the system within one month."

Kathleen Korutz, the office manager, learned to operate the system from the Wang training manual; today, she trains the new word processing operators. "The technology of the MVP is not hard to grasp," she said. "Compiling data using the old manual methods could take as long as a full day; now, it is a matter of minutes," she said.

The Wang 2200 MVP allows Wiley House to standardize information covering virtually every conceivable aspect of a child's behavior, providing a measure of an individual's growth in the treatment program, according to Tom Mentis, director of clinical services.

"Behavior is measured in 40 major classifications with three subclassifi-

cations to each major category. Using the Wang system, we are able to match a child's behavior against statistical norms to determine his or her relation to peers. This technique helps us to structure programs according to the specific needs of a child," he said.

A file of some 20,000 names of actual and potential supporters has been developed. "Shortly after we put in the MVP," Peter said, "we used it to handle a \$30,000 solicitation drive. It's also being used for a \$2.5 million capital campaign, the fruits of which will be a new child development and therapeutic recreation center. Using the MVP, we've been able to raise about \$90,000 a year."

matchmaker,

IBM Displaywriter & HEWLETT PACKARD Series 40 computer system & DATAPOINT 1560 data
processor & HONEYWELL Series 60 computer system & WANG System 35 word processor &
Series 3003 word processor & NCR Comten 3670 computer system & PHILIPS Series 3004
reader & COMPUCORP 700 data terminal & HONEYWELL Series 62 computer system & RA
& HONEYWELL microSystem 6/10th microcomputer & EXTEL B315 data terminal & AM JA
DATAPOINT 6600 data terminal & ANDERSON JACOBSON AJ833 data terminal & HONEYWELL D
HEWLETT PACKARD HP 3000 mainline & PHILIPS INFORMATION SYSTEMS Model 2001E word proces
system & WANG System 30 word processor & PHILIPS 2002 Twin word processor & IBM F
JACOBSON AJ650 data terminal & TRS 80[®] personal computer & LANIER No Problem[™] word p
computer system & WANG 2200 computer system & APPLE IIe personal computer & AM J
PHILIPS Model 2005 word processor & COMPUSCAN AlphaWord III[®] optical character reader
Series 44 computer system & NBI OASys 4000S word processor & EXXON 210 intelligent t
computer system & EXXON 120 intelligent typewriter & APPLE II personal computer &
system & IBM Displaywriter & HEWLETT PACKARD Series 40 computer system & DATAPO
VT 1300 word processor & HONEYWELL Series 60 computer system & WANG System 35 word p
PHILIPS Series 3003 word processor & NCR Comten 3670 computer system & PHILIPS Ser
character reader & COMPUCORP 700 data terminal & HONEYWELL Series 62 computer syst
& HONEYWELL microSystem 6/10th microcomputer & EXTEL B315 data terminal & AM JA
DATAPOINT 6600 data terminal & ANDERSON JACOBSON AJ833 data terminal & HONEYWELL D

© 1983 ITT World Communications Inc



'Hackers Got Into Us Last Night.'

Runs on IBM Machines

Operating System Saves Cost of Programmer

SAN FRANCISCO — When Walker Interactive Products, Inc. here began to offer computer services to outside customers, it could not afford to hire a systems programmer to support the operation.

The DP staff at Walker was already accustomed to working with a variety of IBM operating systems on its 3083 mainframe. Because Walker's primary business is supplying interactive financial software for mainframes, the staff was required to emulate its customers' operating system environments by running VM, VS and VS1.

But when Walker needed an operating system to support its outside

service bureau customers, Data Center manager Thomas Dowling estimated he would need at least one full-time systems programmer if the firm installed an IBM system. Dowling knew that the fledgling company would have difficulty absorbing the cost of a programmer, so he decided to look beyond the range of IBM operating systems.

Walker installed an IBM-compatible operating system — DOS/MVT — offered by San Francisco-based Software Pursuits, Inc. "DOS/MVT let us get by for two years without a full-time systems programmer. That saved us at least \$100,000 a year, or about the price of a 4331. It kept

overhead to a minimum, which is critical when you're selling excess machine capacity," said Walker President Richard Currier.

Dowling performed the conversion last year in a single weekend when Walker installed Software Pursuits' enhanced version of DOS/MVT, the MVT/VSE.

Dowling said he alone maintains MVT/VSE and that Walker never expended any programming effort on either of the IBM-compatible operating systems.

"Even though systems programmers have been on staff for the last year," Dowling said, "we have never spent any programming time on

DOS/MVT or MVT/VSE. We did not hire a systems programmer until we began running [IBM's] VM concurrently with MVT/VSE and began operating OS machines."

Better Features

According to Dowling, the MVT/VSE operating system offered features that outweighed comparable IBM capabilities.

Its Sage spooler was easier to use and more flexible than IBM's Power spooler, he said. Before Walker took delivery of its 3083, it ran Sage in a double-machine environment utilizing a 4341 on loan from IBM and a Magnuson Computer Systems, Inc. Model M80/42 processor.

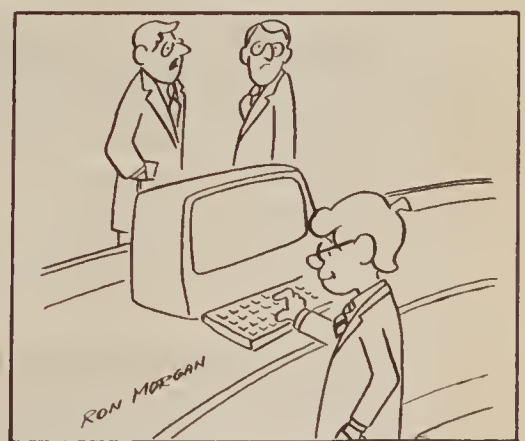
The 4341 handled both on-line and batch jobs, and the Magnuson processed only batch.

From their terminals, Walker's programmers submitted all jobs to the 4341 and, based on machine capacity, Sage ran their batch work on either machine. All jobs were placed in a common queue and then executed in whatever machine the DP staff chose.

That capability, Currier said, gave Walker the processing capabilities it needed until the 3083 was installed.

MVT/VSE's Proc library support feature also provided more flexibility than IBM's MVS operating system's capabilities, Dowling added. For example, "the system's conditional statements multiply the Job Control Language flexibility by permitting a procedure to invoke another procedure, depending on the outcome of a prior step.

They also let the operator restart a job at a specified step by entering a single Proc statement, and variable symbol substitution lets us establish values at runtime."



'What Visitor? . . . He's Our New Programmer.'

FREE 82-PAGE BOOK EXPLAINS TRANSACTION PROCESSING.

A new 82-page book, "SYNAPSE TRANSACTION PROCESSING. SYSTEM OVERVIEW", clearly illustrates how a systems designer can accelerate development of a high-performance, fault-tolerant, on line transaction-processing system.

It discusses automation of integrity and recovery. Tells how to get performance from a Relational DBMS. Describes transparent expansion of a system on line. And it has a complete index.

The book presents a comprehensive, management-level introduction for the nontechnical manager. Yet it provides an adequate overview for the technical manager and staff.

To obtain a free copy, call (408) 946-3191. Or write: Synapse Computer Corporation, Corporate Communications Department CW, 801 Buckeye Court, Milpitas, CA 95035.

© 1983 Synapse Computer Corporation.

matchmaker.

terminal & AM JACQUARD J100 minicomputer & RAYTHEON

COMPUCORP 745 data terminal & CPT 8000 word processor

processor & COMPUSCAN AlphaWord Series 80* optical

ON VT 1200 word processor & HEWLETT PACKARD Series 64

RD J500 minicomputer & EXTEL B318 data terminal &

minicomputer & ANDERSON JACOBSON AJ830 data terminal

& EXXON 140 intelligent typewriter & UNIVAC* 1100

anal Computer & PHILIPS Series 3000 word processor

essor & NCR Comten 3690 computer system & HONEYWE

ARD J425 word processor & COMPUCORP 655 data terminal

AM JACQUARD J600 multi-station computer & HEWLETT

riter & NCR Comten 3650 & NBI OASys 3000S wordpr

ANDERSON JACOBSON AJ650 data terminal & WANG VS 80 com

560 data terminal & AM JACQUARD J100 minicomputer

essor & COMPUCORP 745 data terminal & CPT 8000 wor

204 word processor & COMPUSCAN AlphaWord Series 80*

& RAYTHEON VT 1200 word processor & HEWLETT PACKAR

RD J500 minicomputer & EXTEL B318 data terminal &

minicomputer & ANDERSON JACOBSON AJ830 data terminal

A word processor and a computer aren't a match made in heaven.

Of course, neither are a telex machine and CRT. Or any of the machines listed here.

Rather, they're all matches made by us: ITT World Communications.

You see, until we came along, it wasn't very easy for businesses to send information from a word processor to a computer. Or from a telex to a CRT. Or vice versa.

Now all that (and more) is possible—by sending information through us.

Our network simply eliminates all the usual problems of unlike equipment.

So a company never has to be in the costly position of owning unneeded terminals, just to "talk" to other terminals.

Which means, you'll not only get the communications your company needs, but you could save money as well.

Advanced communications and economy?

It sounds like a perfect match to us.

For more information contact your local ITT sales representative or write Marketing Dept. A/PR, ITT World Communications, 100 Plaza Drive, Secaucus, NJ 07096.

ITT

For Work in Info Engineering

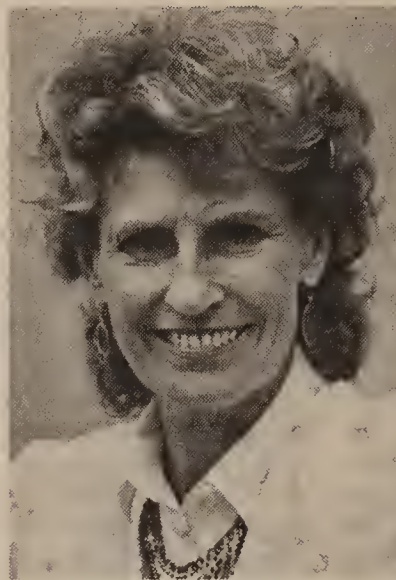
UK Professor Wins Warnier Prize

TOPEKA, Kan. — Enid Mumford, a professor at the UK's Manchester Business School, was recently named the first recipient of the J.D. Warnier Prize for major contributions to the theory and practical application of information engineering. The award was made at the Data Structured Systems Development Users Conference, which was sponsored by Ken

Orr and Associates, Inc.

Mumford has done research in the design and human consequences of computer-based work systems for 15 years. The author of several books on systems design and the involvement of end users, she has developed a systems design methodology called Effective Technical and Human Design of Computer-Based Systems.

The prize received by Mumford was named in honor of Jean-Dominique Warrner, a recently retired member of a research group at CII-Honeywell Bull in France, who is considered one of Europe's leaders in the information science field and has published several books on logical approaches to solving problems with data processing systems.



Enid Mumford

Denver Meet To Address Managing DP Conflicts

DENVER — A seminar on "Conflict Management in the DP Environment" will be held Dec. 5-7 in Denver. It will be taught by Leo Johnson, principal consultant to QED Information Sciences, Inc. of Wellesley, Mass.

The course will help DP managers understand sources of conflict in the DP environment and teach them how to manage that conflict more effectively, according to its sponsors, QED and the Seminar Broker of Broomfield, Colo. Topics will include definition of conflict, exploring the basic elements of conflict, examining conflict resolution styles, interpersonal conflict, intergroup conflict and differences, tools for effective conflict resolution and developing an action plan.

The three-day seminar costs \$500. More information is available from Mary Willard, Seminar Broker, 3212 W. 133 Ave., Broomfield, Colo. 80020.

Syntopican XII To Take Place In Chicago

CHICAGO — Syntopican XII, the annual conference of the Association of Information Systems Professionals (Aisp), will be held here July 17-27.

Syntopicon XII's theme is "Communicating Information: People, Systems, Networks." Professional papers pertaining to the theme in either a technical or managerial sense are currently being requested.

The deadline for receipt of completed papers is Nov. 30, 1983. All submissions will be reviewed and considered by the Syntopican Advisory Committee for possible presentation at the conference or for publication in the annual Papers and Proceedings book.

Registration for the conference is tentatively set at \$300 for members and \$400 for nonmembers. More information is available from Aisp at 1015 N. York Road, Willow Grove, Pa. 19090.



'Your Data Is Home.'

SCIENCE/SCOPE

A high-speed integrated optic modulator for fiber optic applications promises to significantly affect the future of microwave transmissions. The device, developed by Hughes Aircraft Company research scientists, is a guided-wave Mach-Zehnder interferometer. Light entering the interferometer is split into two arms and then recombined. By applying an electric field to one arm, a relative phase shift is induced so that the light, upon recombining, interferes to produce an intensity variation proportional to the applied electric field. The field is applied by a microminiature traveling-wave electrode design with a 3 dB rf bandwidth of 17 GHz. Only 6 volts of drive are required. This modulator will let a fiber optic link transmit simultaneously all common microwave and radar bands.

An advanced infrared seeker now being developed would improve the operating range and accuracy of future air-to-ground missiles and guided bombs. Hughes is producing a scanning focal plane array (FPA) seeker to demonstrate advanced infrared imagery. The sensor is the size of a collar button and consists of tiny infrared detectors on one side and a corresponding number of signal-processing elements on the other. Because the sensor would be more sensitive than existing devices, it can stay locked on small targets more easily, distinguish between targets and background clutter more easily, and detect targets from farther away. The seeker also promises benefits in weight and cost. Hughes also will conduct a study to determine whether the seeker would be feasible for a variety of weapons planned by the U.S. Air Force and Army for between 1990 and 2000.

A new computer system promises to reduce scrap and rework, thereby helping one Hughes group slash costs by an estimated \$1.5 million annually. The Quality Information System (QIS), now under development, will compile and analyze data on how defects happen and how they are corrected. Information will be made available to manufacturing employees for immediate feedback and for use during production. Data will also be kept in a central historical file for future reference. QIS is expected to improve quality by spotting problems that stem from faulty design, poor supplier quality, and improper manufacturing methods.

An infrared sensor made of standard components turns night into day for tanks and other combat vehicles. The compact device, called Hughes Infrared Equipment (HIRE), was designed to be low in cost yet high performing. It can be adapted to periscopes to let gunners of such tanks as the M48 see through darkness, haze, or battlefield smoke. HIRE can be mounted in laser tank fire control systems, light armored vehicles, or used as a target acquisition/fire control sight for anti-aircraft, ship, and helicopter applications. The design uses U.S. Army common modules, the standard building blocks for thermal imaging systems.

Hughes Research Laboratories needs scientists for a spectrum of long-term sophisticated programs. Major areas of investigation include: masked ion beam lithography, liquid-crystal materials and applications, submicron microelectronics, ion propulsion, and new electronic materials. For immediate consideration, please send your resume to Professional Staffing, Hughes Research Laboratories, Dept. SE, 3011 Malibu Canyon Road, Malibu, CA 90265. Equal opportunity employer.

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY

For additional information please write to:
P.O. Box 11205, Marina del Rey, CA 90295

Once, and for all.

Cullinet's General Ledger and Financial Software System.

Enter an item in one component of Cullinet's Financial System, general ledger for example, and it's entered in all of Cullinet's Financial System components.

Enter it once and you can access financial data through any of eight components.

Entered once, it's available for all.

This is only possible because all of Cullinet's Financial components share a common database. This integration is so thorough that data can be called up from separate components joined and viewed together at the same time. This integration also extends to the full line of Cullinet applications software (our

manufacturing system, for instance).

Personal computer applications are also integrated in this unique enter-it-once-enter-it-for-all system. A person can access financials directly from the database, manipulate them on a personal computer and then store the results in Cullinet's

Database Management System.

Features such as these suggest that Cullinet's Financial System may be the most effective way to eliminate data redundancy, facilitate monthly closings and,

most important, make accurate financial information accessible to the people who most need it. When they most need it.

Once, and for all.

For more information and a schedule of seminars on Cullinet's Financial System, call (617) 329-7700.



Cullinet

Seminars on Cullinet's Financial System will be held in the following cities during the coming weeks: Harrisburg, PA Nov. 22; Meadowlands, NJ Nov. 30; Minneapolis, MN Nov. 29; Regina, SASK Nov. 15; Tampa, FL Nov. 29; Valley Forge, PA Dec. 1; Vancouver, BC Nov. 30 and Washington, DC Nov. 22.

To reserve a place call Harry Merkin at (617) 329-7700.

© 1983 Cullinet Software Inc., 400 Blue Hill Drive, Westwood, MA 02090

Graphics Tool Helps Bechtel Rewrite Application Library

WALNUT CREEK, Calif. — When Bechtel Power Corp. here decided to rewrite its entire library of accounting and financial applications, the DP department was faced with a costly and time-consuming documentation effort.

In May 1979, the controller's organization within the company began a development effort called the Controller Financial Information Systems (CFIS) project to replace Bechtel's existing applications programs, such as payroll, billing and accounts payable. Scheduled for completion in 1986, CFIS will support all of Bechtel's permanent offices and the many remote offices it maintains at its electric power, petroleum and mining projects around the world.

The development method Bechtel planned to use on the CFIS project incorporated structured analysis techniques, such as data flow diagramming, to describe user requirements. While this technique was a proven and effective approach to software system development, it would require a great deal of time to draw and redesign diagrams.

Documentation for the project would include several hundred data flow diagrams alone. The project team needed an automated tool to relieve it of the task of drawing and proofreading these documents.

After reviewing a variety of programmer productivity packages, the project team chose the Stradis/Draw interactive graphics system from McDonnell Douglas Automation Co. of St. Louis, Mo. The package facilitated the drawing and revision of the CFIS project data flow diagrams and systems structure charts on Bechtel's two Tektronix, Inc. Model 4113A color graphics terminals, which access an IBM 3033 mainframe.

Stradis/Draw allowed the design team to construct diagrams on-screen through a menu-driven process. All the graphics symbols used to design the structured diagrams were defined within the system; they could be identified using a function key and positioned on the display screen by the terminal cursor.

After the project team created a diagram, the diagram could be maintained in an interactively accessible file for on-line editing, and hard-copy plots of the diagrams could be produced for presentations.

Bechtel has used Stradis/Draw to support documentation of the entire CFIS project thus far, reportedly saving considerable time and money. With the McDonnell Douglas package, project members gave rough diagram copies to a data entry operator who entered the diagram. By allowing someone else to generate and maintain diagrams, the package permitted the project analysts to concentrate on important design activities.

Because the data entry operator was not required to redraw an entire diagram to make revisions, the amount of proofreading involved was reduced.

In addition, Bechtel has saved money in producing permanent hard-copy diagrams for the CFIS project. Printed diagram copies from Stradis/Draw were found to be

cheaper to produce than those done manually by a graphics department. Also, while the diagrams were of equal quality, the time required to produce copies with the package was substantially less.

Project analysts also used a "free-form" diagram function of Stradis/Draw to develop a variety of other charts and graphs for management presentations.

Bechtel has also reaped some other benefits. Since the CFIS analysis team began to use the Stradis/Draw package, it said it has achieved greater consistency within the library of diagrams. The system has helped maintain a standard presentation for-



The Stradis/Draw Interactive Graphics System

mat, which is used by the many application groups generating diagrams for review by the end-user

community. The end users have said the Stradis/Draw documents are easy to review and understand.



And Reduces Telecommunications Costs

Engineers' WP System Cuts Prep Time by 85%

CHERRY HILL, N.J. — An engineering firm here has cut preparation time for specifications and energy audits by up to 85% after switching from typewriters to a word processing system. Telecommunications costs are down as well, and automated recordkeeping has become a source of management information.

Colm Engineering has handled planning and design for more than 170 projects since it was founded 11 years ago. The firm has a long-standing involvement in energy conservation and management, as well as alternative energy systems.

In the past, getting project speci-

cations typed often turned into a headache, according to Howard Colm, company founder and president. Depending on the type of project, a specification can have as many as 200 pages. In the early years, Colm had his typing jobs done by a service bureau. Turnaround time was slow, however, and corrections added more costs and delays. Eventually, the company began handling part of the typing load in-house on an electronic typewriter, but putting together a specification was still "cut-and-paste." To grow and serve its clients better, Colm concluded, his company needed word processing support.

A survey of some 40 systems in 1979 by Colm's son Stephen, also an engineer, ended in 1980 with the choice of a Wang Laboratories, Inc. Word Processor System 5/III. "We were looking for superior equipment, and we felt we'd give better service with Wang systems," Colm recalled.

The system, purchased in 1980, consisted of a dual-diskette drive, a workstation and a daisywheel printer. A second System 5 was added within a year. In late 1982, Colm replaced both stand-alone System 5s with a Wang Office Information System (OIS) 105. Equipped with telecommunications capabilities and

built around a master processor with a single-diskette drive and a 4.2M-byte system disk, it includes two workstations and a printer.

Since the first system went on-line in the fall of 1980, Colm and his staff have worked out a highly efficient procedure for producing specifications. Time savings begin at the drafting stage. Parts of earlier specifications often serve as starting points for writing up a new project. Rather than piece a draft together himself, an engineer now asks a secretary for sections or selected pages of appropriate specs. The secretary then electronically retrieves and merges them into a new draft.

While everyone else has been squawking about private networks, one company has been quietly building them.

Today, with dozens of new companies and hundreds of unproven products all promising to perform networking miracles, the noise level has become exceedingly loud.

And the job of finding the right company to build your network has become more confusing than ever.

Meet BBN Communications. In the midst of the noise and confusion, we've been quietly building networks for government agencies and major corporations around the world. In fact, we built the world's first packet-switched computer network back in 1969.

But what sets us apart even more than our experience is the way we work. Instead of the usual short-term "fixes," we're committed to providing long-term solutions. So before we design your network, our communications consultants will analyze your specific needs—present and future. And based on them, establish your optimum network configuration. Then we'll build your network. Of course, even after everything is working to your satisfaction, we'll still be around to help with your future needs.

It takes more than computers to make a computer network.

Another thing that makes us different is that we manufacture a full line of our own proven networking hardware and software, not just a few isolated products. Including packet switches, terminal access



Our communications processors are the most advanced available today.

devices, and electronic mail systems. All of which simply means we can supply everything you need.

What's more, our entire product line is fully X.25 compatible and easily interfaces with public data networks.

But state-of-the-art technology is just the beginning. We also provide a network operations center so



Packet-switched networks built by BBN Communications link companies with offices around the world.

you can monitor your entire network at a glance and control it almost as easily. We'll even run the center for you if you like. And to ensure maximum network reliability—and uptime—we offer round-the-clock field service by the most experienced communications engineers in the business.

Just because we're the networking leader, don't think for a minute that we're resting on our accomplishments. Our R and D effort is one of the largest in the industry, with major programs in protocol development, network control, and future network applications. And, of course, our customers receive the full benefits of every breakthrough we make.

We're the networking leader.

Fifteen years ago, we pioneered packet-switching technology to build the Arpanet, the world's first packet-switched computer network. Today, Arpanet supports 10,000 users and over 300 different computers in the United States and Europe, and the technology we invented for it has become a cornerstone of the data communications industry.

As the networking leader, our customers include major financial, manufacturing, and industrial corporations from all over the world. Recently we've even been selected to build and run the U.S. Defense Department's major new computer network, the Defense Data Network.

So if you're tired of all the squawking, consider BBN Communications. We think it's about time you got your network, and some peace and quiet, too.

For a brochure on our complete networking capabilities, contact BBN Communications Corporation, 33 Moulton Street, Cambridge, MA 02238, (617) 497-2800.



BBN Communications Corporation

Little New Typing Required

Because a draft already exists in electronic form, very little new typing is required. Editing functions such as delete, insert, move and copy make it easy to enter revisions, executive secretary Ursula Bielecki reported. Paragraph files allow quick retrieval of often-used blocks of text. To insert entire pages into specifications, she prefers to create glossaries, which allow her to call up text with two keystrokes. She has also written glossaries to speed up entries on standard forms.

"The most important thing for us is to give our customers service, and the best way to do that is to respond quickly," Colm commented. "We can put together a specification in two days instead of a week and a half, and we get to do a much more professional job."

The ability to rearrange charts or tables quickly led to a successful experiment: Equipment schedules for the drawings that accompany specifications are no longer written by hand or typed, but produced on the OIS. Printouts of the schedules are copied onto adhesive-backed mylar, which is then attached to the drawings. Schedules are stored on diskette, so the formats can be reused.

Technical assistance reports are another service the company has successfully automated. Colm has also built a file of some 150 energy-saving maintenance and operating procedures. "That way we can do the reports competitively," Colm maintained. "In fact, we paid for the first System 5 on one of these projects."

Telecommunications costs have been down since staffers began transmitting data through one of the System 5s and later through the OIS. "With the data terminal we had been using, we were putting the data in at a much slower rate, and we didn't have that much storage capacity," Colm explained. "Now, we load the data on the disk and then put it all out at one shot. And we can receive the analyses on the disk and print them at our leisure."

For Colm, office automation has become an indispensable competitive tool. "We were probably one of the first companies in this area to install a word processing system," he said. "The next step we're going to take is to automate drafting. You have to move in this direction. It's the only way you can increase productivity and serve your clients."

DBMS Spurs Parisian Horse Racing to the Wire

PARIS — In France, data processing is as integral a part of horse racing as horse racing is to the French.

The DP department of the Societes des Courses Parisiennes is made up of five different departments that deal with a variety of management applications, including licenses for over 250,000 horsemen, insurance and diplomas for the French Equestrian Federation.

The bulk of data processing, however, relates to horse-racing information processing. At the beginning of each year, all data regarding the races for that year are entered into the data base system. After each race, a series of updates and print-outs is required. More than 300 data entries are gathered for each horse, over 70 of which deal with blood types.

After each race — over

15,000 are held every year — 250 operations have to be performed for each of the first five winners, according to DP manager Jean-Louis Maldant. These operations require the transfer of data to third-person accounts — owners, jockeys, trainers, stable boys — all according to a system of various bonuses and compensations that are subject to a very complex horse-racing code.

The very severe constraints and controls of the Societes, as well as the quantity and importance of the information to be processed, caused Maldant's department in 1975 to consider the purchase of a data base management system (DBMS). Until then, the department had been working with sequential and indexed files.

Maldant's investigation of various systems took two

months. Each system was evaluated for its ability to respond to the severe specifications needed to manage the accounts of show-horse owners. Finally, Cullinet Software, Inc.'s IDMS was chosen.

"IDMS brings much better efficiency and is easier to use and develop applications with than IBM's DL/1," Maldant explained. "Certain aspects of modeling and processing using other DBMS were more difficult to implement."

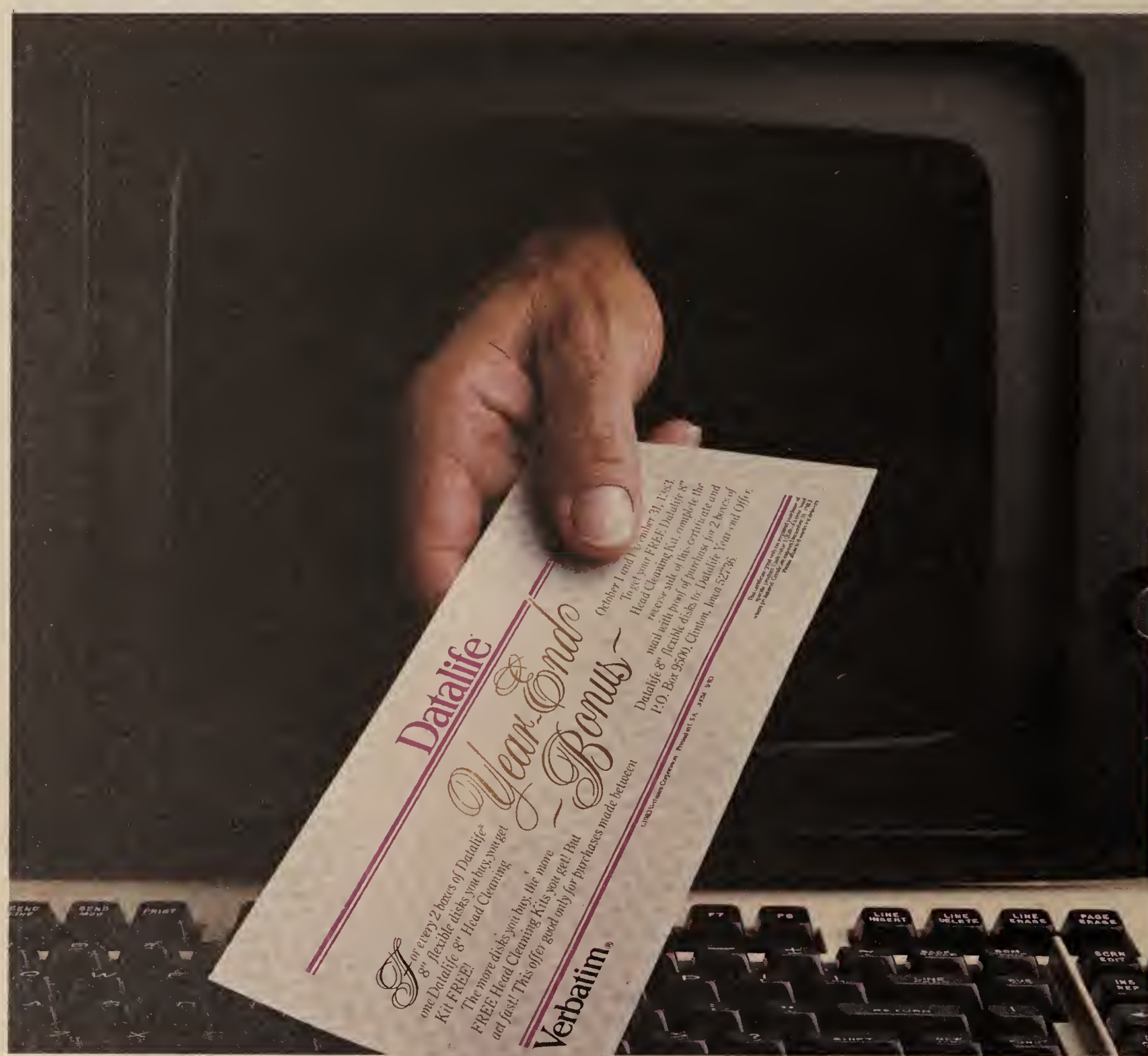
According to Maldant, IDMS was chosen as "the system which could best meet the particularly severe requirements of the Societes: very large amounts of elementary data, numerous and complex overlappings of technical and management data, the need for fast updating and distribution of information and the generation of a great number of financial operations made from technical data."

Another consideration that tipped the scale in favor of IDMS was the system's ability to modify the structure of data, which is critical for an organization such as the Societes des Courses Parisiennes, whose rules evolve continuously.

IDMS was installed in 1975, and today, using Cobol as the main programming language, IDMS runs on two IBM 4341 systems with over 120 terminals throughout the organization.

Until 1978, five different services had to be processed separately: "people," "horses," "races," "results" and "accounting." With IDMS up and running, one information structure is enough to feed the whole organization, and 80% of all account operations are automatically generated, including those concerning compensatory operations with foreign countries.

"One of the main strong points of IDMS in comparison to its competitors is the great ease and rapidity of development with Cullinet's Application Development System/Online," Maldant said. "This allows considerable savings of time and money, given the large quantity of data to be processed."



Year-end Bonus!

For every box of Datalife® 8" flexible disks you buy before December 31, 1983 you get a Datalife 8" Head Cleaning Kit FREE!

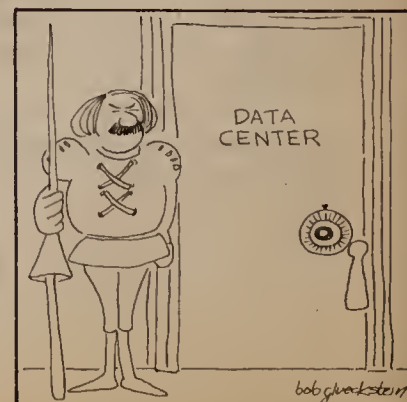
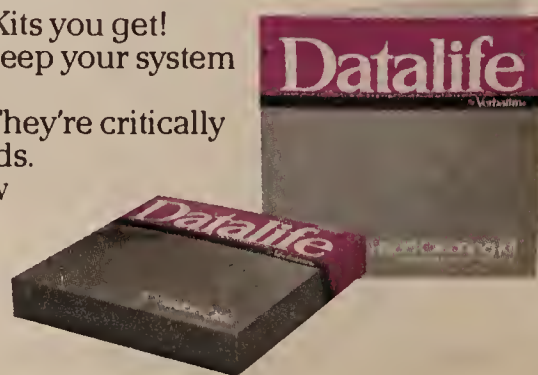
The more disks you buy, the more FREE Head Cleaning Kits you get!

Datalife Head Cleaning kits are the fast and easy way to keep your system running cleaner, performing better.

Datalife flexible disks make the performance better yet. They're critically certified 100% error-free. They meet or exceed all ANSI standards. They're backed by a 5-year warranty.* And they're available now with the Head Cleaning Kit bonus.

To get your hands on this year-end bonus, call your Verbatim distributor. Or call us toll free at 800-538-1793. Outside the U.S. or in California, call collect (408) 737-7771.

But hurry! This bonus ends at year-end.



Retrieves Data, Generates Reports

Package Eases Processing for Rainware Maker

ELDERSBURG, Md. — Think of fog and you invariably think of London. It should follow, then, that if you think of London Fog raincoats, you think of London. Right? Wrong.

Londontown, the company that stole trench coat fame away from Humphrey Bogart, is alive and well and producing London Fog rainwear in Maryland.

To make life sunnier for those involved in data processing, Londontown recently installed a data base query software package.

Ralph A. Hoffmeister, data base administrator for Londontown, implemented Scientific and Business Systems, Inc.'s Easywork package in order to define the data structure, retrieve data and generate a report in one step. Londontown installed Easywork in 1980 when the company's computer system consisted of a

Honeywell, Inc. 66/60 mainframe running under Honeywell's Gcos 3 operating system. Shortly thereafter, the company upgraded its hardware to a Honeywell, Inc. DPS 8/52 mainframe also running under Gcos 3.

Upgrade to 'Umbrella' Package

Londontown is currently upgrading its software from Honeywell's IDS 1 DBMS to Honeywell's DM4, an umbrella software package that includes IDS 2, an upgraded version of IDS 1, and a Cobol 74 compiler with transaction processing software. The system also includes five Honeywell MSU 500 disk drives and four MSU 450 disk drives.

According to Hoffmeister, Londontown is constantly trying to develop more on-line systems. His staff of five is responsible for all data base design, implementation, restart/re-

covery and security, as well as for defining the system parameters for their on-line systems.

In addition, the group develops interface modules for the integration of data with different systems. (Other functions are handled by three additional groups in the DP department, which numbers some 65 people in all. Half of these form the Operations Group; the rest, the Technical Support and Analysis/Programming Groups.)

Rewriting Programs Eliminated

"By using Easywork for the generation of data base content reports under the IDS 2 environment, the necessity of having to rewrite all 'chain walk' programs is eliminated since Easywork will generate that capability," Hoffmeister said.

When Easywork was installed, its chief uses were in the order processing and engineering departments as well as in the Data Base Group for producing sophisticated reports from their data bases. The DP department is the biggest user of the package, with the majority of applications going to the departments that have the fewest management decision-making systems available to them — the sales and marketing departments.

The marketing department, like marketing departments elsewhere,

however, is acknowledging the potential of DP. One of the most recent Easywork applications is a three-pronged marketing report which contains a comparison of bookings with both the forecast and the inventory position.

"This is the first time we've been able to produce a single report that combines the results of these three different applications," Hoffmeister said.

Priority Basis

All requests for Easywork-generated reports are handled by Hoffmeister's department, which enables him to control the system and allocate resources on a priority basis.

Opening up the system for anyone to submit reports at will would necessarily exclude other, perhaps more important, jobs; so, at least for the present, the Data Base Group is serving as a clearinghouse for all such requests.

"However," Hoffmeister added, "we've just implemented Easywork's interactive feature, and our planning for end users includes allowing Easywork usage by non-DP personnel." The group is presently evaluating use of Easywork as a Cobol generator for the development of production systems for reports that are run frequently.

Free Brochures

• "V/Update," a free monthly newsletter, is available to all VM installations from VM Systems Group, Inc., developers of VM software products. The newsletter contains

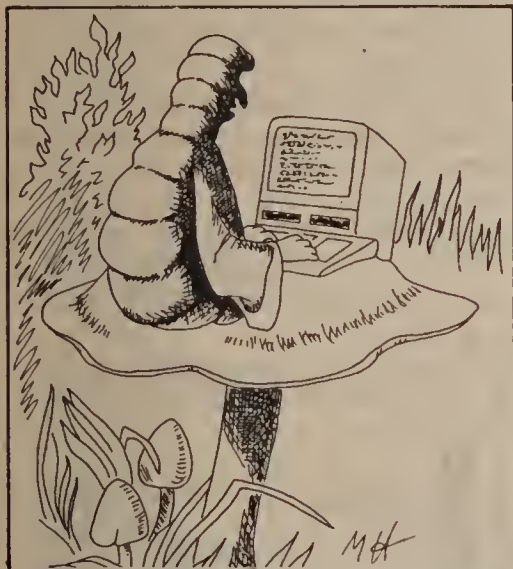
hints and information for VM installations.

To receive "V/Update" or information about products, contact VM Systems Group, Inc., 3123 N. Military Road, Arlington, Va. 22207.

• "The Tape Management and Evaluation Technical Manual" is a 48-page manual from Data Devices International, Inc. that describes tape fundamentals and provides a completed description of data transfer losses. It outlines a systems approach to media maintenance.

The manual discusses the three phases of media maintenance and provides detailed instructions for each phase. A technical reference and glossary of terms is included, together with a reference list.

The manual is from Data Devices International, 20235 Bahama St., Chatsworth, Calif. 91311.



Micro/Mainframe Chaos?

Avoid It

IBM has some of the answers. Other vendors offer compatible alternatives. None of the vendors are unbiased.

What is the best solution in an IBM world?

Get the unbiased facts from the independent research firm that specializes in educating computer users and planners in IBM mainframe environments. Be prepared to leave this seminar with answers to tough questions.

"A superior technical seminar."

Henry Williams, Sr. Software Analyst, Republic Steel

"Martin is absolutely terrific! I would welcome the opportunity to attend any of his future TechTran seminars."

William F. Ramsay, Sr. Technical Analyst, Abbott Labs

Join other sophisticated users...Attend this popular TechTran seminar...

Minis/Micros with IBM Mainframes

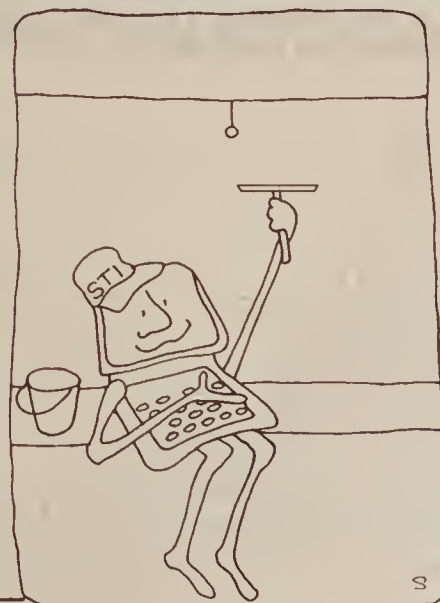
December 5-7 Atlanta \$795

For instant registration or information

Contact Melissa Marr (203) 348-2212
TechTran, Inc., PO Box 10212 Stamford, CT 06904

TechTran is a subsidiary of GARTNER GROUP, Inc.

MAKE YOUR VAX DO WINDOWS



SMARTSTAR™ is the first VAX information management tool that creates multiple window applications—and can scroll your screen to 400 lines. The SMARTSTAR family includes:

- SMARTDESIGN™ for designing applications without programming
- SMARTQUERY™ for powerful, easy-to-use application processing
- SMARTCALL™ when VAX host programming is required
- REQUEST for integrated report and query

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone () _____

SEND COUPON NOW FOR DETAILS AND JOIN THE 4TH GENERATION



Signal Technology, Inc.

5951 Encina Road, Goleta, CA 93117 (805) 683-3771 Outside California call toll-free (800) 235-5787
TWX 910-334-3471

VAX is trademark of Digital Equipment Corporation

Desktop Speeds Freight Rates to Firm's Clients

UNION, N.J. — Before installing a computer to handle its freight consulting business, F.H. Traper, Inc. had to rely on an all-manual system, which was complicated, time-consuming and prone to human error.

Now, however, a desktop micro-computer takes care of all that and reportedly provides accurate freight rates for its clients in less than 30 seconds.

The ability to produce extremely fast, accurate freight and invoice documentation can substantially impact profitability in many corporate areas — from finance to marketing — according to Glenn A. Fishman, president of the two-year-old firm.

Up until a few years ago, managing transportation cost data — the number-one activity of traffic/distribution departments — had to be done manually, using paper ponies (tariff guides) and a space-consuming reference library of regulatory and rate tomes. Unless shippers and carriers employed some type of automated, freight rate updating service, the rates for most shipments were incorrectly derived and posted, according to Fishman.

Also, with the advent of deregulation of freight rates (Motor Carrier Act, 1980 and Staggers Act-Rail, 1978) the increase in paper/tariff data was complicated further. The proliferation of tariffs and tariff changes produced more chaos in the

management of the freight tariff functions, Fishman said. "We needed even further refinement of our approach to rate maintenance and tariff data control. Computerization was the only answer to increased productivity and accuracy at lower costs," he added.

Confronted with the overwhelming impact of deregulation, Traper started investigating alternatives to existing automated systems in the spring of 1982. Among the software companies examined were Numerax, Inc., ESI, Inc. and Rand/TDM, ac-

cording to Marc Cooper, Traper executive vice-president.

"We were aware that Lester A. Probst, president of Transportation Concepts and Services, Inc. (TCS) had covered this information in presentations given at various transportation seminars and conferences," Fishman noted. The Probst demonstrations convinced Cooper to purchase two Trans-Port systems from Bell & Howell.

Each Trans-Port system consists of an Apple Computer, Inc. Apple IIe system and software designed by

TCS, Cooper said.

Traper claims the desktop Trans-Port system has proven to be three or four times faster than on-line computer systems and at least 500 times faster than manual freight rate retrieval. It is also less costly than using typical manual techniques, a service bureau or a time-share facility.

The system also allows the firm to handle clients that have great work loads. For example, for a major manufacturer of beauty products, Traper now processes over 40,000 bills monthly.

Monitors Electrical Consumption

System Helps Hotel Casino Cut Power Bill

LAS VEGAS — Over the past four years, a hotel and casino here has cut its power bill by more than \$248,000 by installing a computer to help control electrical consumption. The system monitors the power meter and automatically shuts off unused equipment.

From March 1979 to March 1983, despite rate increases, the Frontier Hotel and Casino's power bill went down by more than \$248,000, according to Curt Thompson, Frontier's vice-president in charge of hotel operations. Nearly two million fewer kWh of electricity were used in 1982 than in 1978.

In addition to saving money, the Frontier received a governor's award in 1982 for energy conservation.

The IBM Series/1 controls 52 electric devices, ranging from air conditioning and ventilation equipment in the casino and conference rooms to the bulbs on the marquee.

The hotel's engineering crew can override the computer at any time and program it to switch on specific circuits at certain times of the day.

Richard Lang, manager of facilities projects for Frontier's parent company, Summa Corp., said the hotel approached energy conservation cautiously.

"We're running a resort," Lang said. "People come here to be comfortable."

The computer does not interfere with the cooling system in the casinos or showrooms during the peak business hours between 3 p.m. and 2 a.m. After 2 a.m., the Series/1 shuts off the air conditioning for at least a few minutes of every hour.

The hotel tries to maintain a conducive temperature level. "We think because of the tension and excitement, people may become a little bit warmer and, consequently, they'd like it to be a little cooler than a typical office," Lang said.

According to Richard Whelan, Frontier's chief engineer, lighting, ventilation and air conditioning in the gaming, show and conference rooms account for 60% of the hotel's electric bill. There are 20,000 lights in the signs alone.

Air conditioning and lighting in

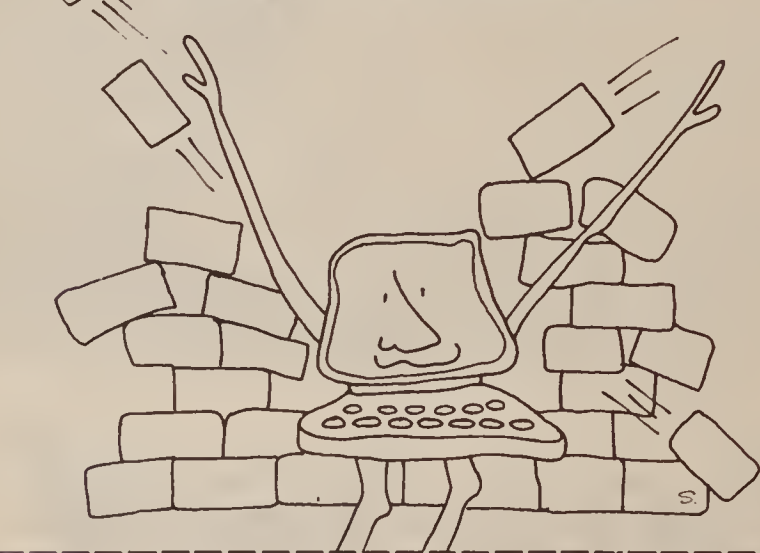
the guest rooms consume 25% to 30% of the hotel's power, with the balance consumed by a variety of appliances. Slot machines require very little electricity, according to Whelan.

Phil Arce, president of the Frontier, said management is committed to the energy conservation program and additional steps will be taken to reduce further the hotel's power bill.

The hotel plans to install banks of low-voltage, 50W lights over the gaming tables, replacing the high-voltage, 500W quartz lights now in use. The new lights will reportedly provide better lighting and use less electricity.

The Frontier also plans to install movement sensors in its guest rooms. When the rooms are empty, the air conditioning will be switched to a more energy-efficient setting. When a guest returns to his room, he'll be able to readjust the temperature to his liking.

BREAKTHROUGH IN VAX/VMS™ SESSION/IMAGE ACCOUNTING



Only TRACS™ allows examination and tracking of VMS session/image resource data by user, time interval, terminal port and other key fields. TRACS offers:

- General query and interactive capabilities
- Flexible report writer and graphics
- Full screen forms editor

Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____
 Phone () _____

SEND COUPON NOW FOR COMPLETE DETAILS!



Signal Technology, Inc.

5951 Encina Road, Goleta, CA 93117 (805) 683-3771 **Outside California call toll-free (800) 235-5787**
 TWX 910-334-3471

VAX/VMS is a trademark of Digital Equipment Corporation



'You'll Like Being Unemployed. The Hours Are Good.'



VisiCalc

For TSO or VM/CMS

DYNACALC

FASTER THAN THE COMPETITION!

- More mainframe features
- External file support

FOR A FREE
30-DAY
TRIAL CALL:

(312)
525-6400



738 N. LaSalle
Suite 2
Chicago, IL 60610

*VisiCalc is a registered trademark of VisiCorp.
 VisiCorp is not associated with Dynacalc.
 **Dynacalc is owned by Dynasoft Corp.

Effects Changes in System Requirements

Rolm's Growth Produces Special DP Hurdles

SANTA CLARA, Calif. — A dramatic growth rate over the last five years at Rolm Corp. here has brought with it special kinds of data processing problems. The manufacturer and distributor of computer-controlled voice and data private branch exchanges, electronic office products and Data General Corp.-compatible computers has seen annual sales rise to nearly \$500 million while the number of employees has increased to more than 6,500.

Five years ago, Rolm contracted with Ross Systems, Inc., a Palo Alto, Calif.-based time-sharing company, to provide a proprietary financial consolidation and reporting system. However, Rolm's sales growth soon led to changes in system requirements.

First, Rolm decentralized, creating several new divisions. Then each new division hired its own financial executive who had unique information requirements. Procedural delays and costs associated with relying on an outside vendor for program changes increased to an uncomfortable level, according to Mark Bronder, corporate division controller.

In addition, Ross Systems' Maps, a proprietary decision support system (DSS) language, was a precompiler with embedded Basic instructions. While it was capable of meeting sys-

'The decision support system developed by and for Rolm's corporate staff "has cut the time required to consolidate monthly actuals and forecasts at least in half, thus freeing several highly paid financial professionals for analytical rather than 'rack 'em and stack 'em' duties.'"

tem specifications, major changes required too much time. With limited time and a tight budget, Rolm was forced to take shortcuts in some crucial areas, according to Stephen Locke, financial systems analyst.

The company decided to bring the development and maintenance functions in-house and seek a more flexible DSS language to run on its IBM 4341 Model Group II processor. Twenty-two DSS tools for mainframes were examined.

Ultimately, both a DSS language and Information Builders, Inc.'s Focus, a stand-alone data base management system/report writer, were acquired. Focus has been successfully used on several applications, but has proven to be inadequate for financial matrix applications, Locke said. Much of the functionality is mutually exclusive.

Number of Report Formats	200 +
Number of Line Items	300 +
Number of Months	48
Number of Reporting Entities	37
Number of Consolidation Levels	5
Types of Data	Actuals, Forecast, Target
Virtual Memory	3 MB
Disk Storage	190 CYL (IBM 3375 Disk Drive)
IBM 4341 CPU Hours/Month	5-6
Number of Users	30 +
Number of CMS ID's	17
Language	EMS
Vendor	Economic Sciences Corp.
Operating System	VM/CMS

Rolm Chart

Figure 1: Facts About Facts, the Rolm DSS

EMS from Economic Sciences, Inc. of Berkeley, Calif., was selected because it provided fourth-generation capabilities, efficient computer resource utilization, was available on IBM mainframes under VM/CMS and could be brought in-house on a monthly leased basis, Bronder said.

Using EMS first on National CSS, Inc.'s time-sharing service and later in-house, a DSS called Facts was developed by and for the Rolm corporate staff to consolidate actual, forecast and targeted financial data from

the various divisions (see Figure 1). One systems analyst developed and implemented the first release of Facts, including comprehensive documentation, within five months.

"The system has cut the time required to consolidate monthly actuals and forecasts at least in half, thus freeing several highly paid financial professionals for analytical rather than 'rack 'em and stack 'em' duties," Bronder said.

The system has now been extended

(Continued on Page 64)

China Computerworld

The only specialized computer publication written exclusively for the People's Republic of China (PRC).

The PRC is a huge country which now has a rapidly growing installed base of computers. And the future looks very bright for the Chinese EDP market.

Government plans call for extensive use of computers in the PRC's technological modernization, and annual EDP expenditures are expected to grow into the billions of dollars in the 80's.

A good deal of this money will be spent on foreign computer equipment and the purchase decision-makers for this equipment will be using China Computerworld to help them choose the products and the companies they need.

China Computerworld is a joint venture of the Fourth Ministry of Machine Building and CW Communications/Inc. Its 50,000 subscribers include the key government officials and computer managers who have EDP purchase decision authority.

China Computerworld is published on the fifth and twentieth of each month. Its tabloid newspaper format gives you a unique opportunity to introduce your products and services to this awakening giant of a marketplace.

CW International Marketing Services Department gives you one-stop advertising service in countries around the world. For more information about China Computerworld or any of our other foreign publications, just fill out the coupon below.

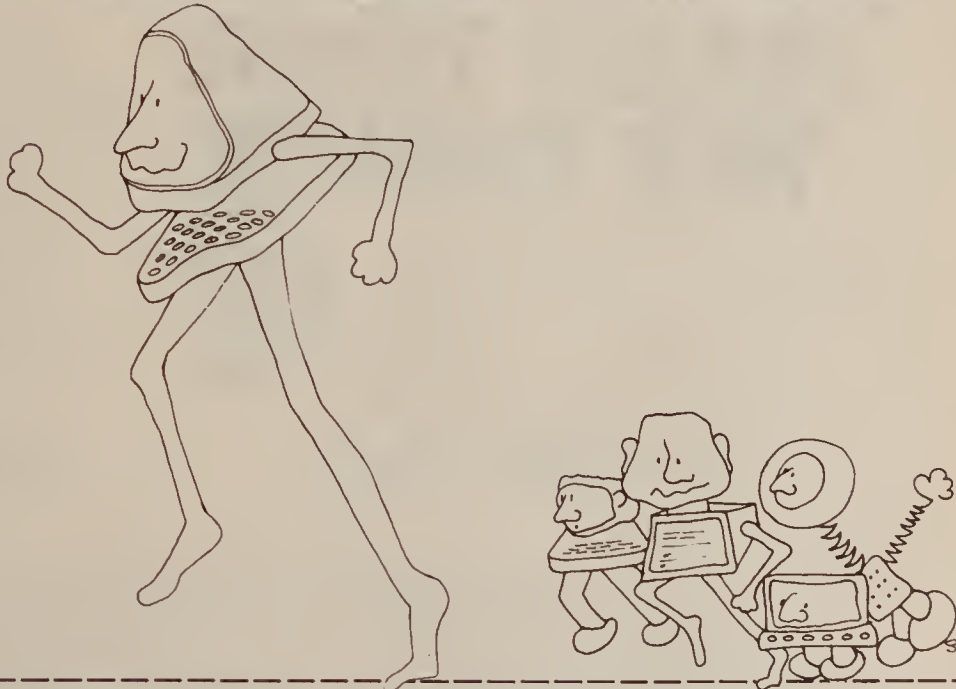
Diana La Muraglia, Manager, International Marketing Services
CW Communications, Inc.
375 Cochituate Road, Box 880, Framingham, MA 01701 • (617) 879-0700

Please send me more information on
☐ China Computerworld ☐ Your other foreign publications

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____

CW COMMUNICATIONS/INC.
Publishers of Computerworld and other
leading computer publications around
the world.

FOR VAX™ RESOURCE ACCOUNTING, PACS™ IS AHEAD OF THE PACK



The competition isn't even close. PACS is so good, it's the **only** resource accounting package in DEC's™ EAS library. Here's why:

- Flexible billing algorithms
- User budgeting and port speed accounting
- EZLOG™ for true 3-level reporting by account, project and user

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone (_____) _____

SEND COUPON NOW FOR COMPLETE DETAILS ON **ALL** THE PACS BENEFITS



Signal Technology, Inc.

5951 Encina Road, Goleta, CA 93117 (805) 683-3771 **Outside California call toll-free (800) 235-5787**
TWX 910-334-3471

VAX and DEC are trademarks of Digital Equipment Corporation

Rolm's Growth Brings With It Special Hurdles

(Continued from Page 63)

ed to the largest division at Rolm, which sells and services Rolm products, he said.

One systems analyst "cloned" and modified the corporate version of Facts in weeks.

Users Across the Country.

Users from 14 sales and service subsidiaries located across the country enter data into this system. These users access the system via Tymshare, Inc.'s Tymnet into a Tymnet engine that is located at Rolm in Santa Clara and from there into a Rolm digital computerized branch exchange (CBX) that is equipped to handle both voice and data communications.

The Rolm CBX acts as a local-area network allowing users access to their choice of processors, including 14 Hewlett-Packard Co. HP 3000s, 23 DG Eclipse MV/8000 superminicomputers and the IBM 4341.

Users of Facts select the IBM 4341 and then access the system (see Figure 2).

"Ease of system development and the ability to respond quickly to sys-

tem maintenance and enhancement requirements is a major advantage of EMS," Locke explained.

"A total investment of less than 1½ man-years over a two-year period has been made in Facts, including development, constant changes and expansion and major reorganizations

of the company," according to analyst Locke.

Though he conceded that the learning curve on EMS is fairly high, financial analysts previously untrained in computers have successfully used the computer to meet their needs, sometimes preferring to use

EMS for "quick-and-dirty" analysis over Visicorp's Visicalc on a personal computer.

Now EMS does the heavy-duty computing while personal computers handle ad hoc analysis where access to the large Facts data base is not mandatory.

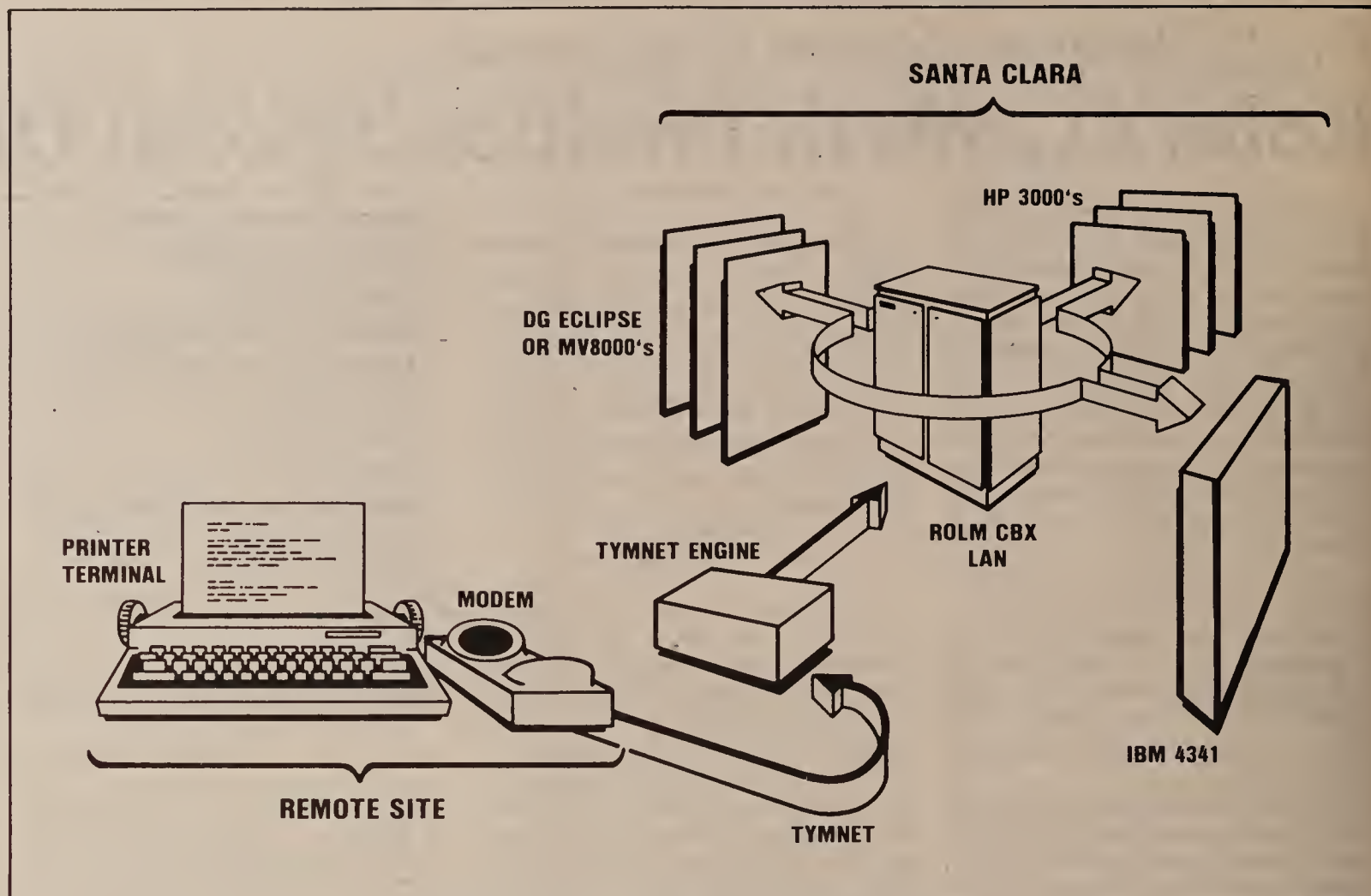


Figure 2: Rolm's Telecommunications Link

Rolm Chart

MAKE YOUR VAX™ DANCE



The QUICKSTAR™ family of VAX utility programs increases speed, efficiency and user enjoyment. QUICKSTAR includes:

- QUICKSTAT™ for interactive system status monitoring
- QUICKTALK™ for speedy inter-terminal communication
- QUICKCHANGE™ for username switching with no manual logout/login

Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____
 Phone (____) _____

SEND COUPON NOW FOR COMPLETE DETAILS!



Signal Technology, Inc.

5951 Encina Road, Goleta, CA 93117 (805) 683-3771 Outside California call toll-free (800) 235-5787
 TWX 910-334-3471

VAX is a trademark of Digital Equipment Corporation

Tristar Data Systems to Hold Meet on Corporate Use of Micros

CHERRY HILL, N.J. — Tristar Data Systems, Inc. will hold a free one-day seminar Nov. 15 at the Sheraton-Poste Inn here on the use of microcomputers by corporate executives and DP managers.

The seminar will focus on integrating microcomputers into large corporations and will feature addresses by representatives of a vari-

ety of microcomputer manufacturers, Tristar said.

The featured speaker will be author Victor Vurpillat, who recently completed a public television series titled *Conversation With the Future*.

More information is available from Tristar Data Systems, Cherry Hill Industrial Center, 2 Keystone Ave., Cherry Hill, N.J. 08003.

Uptime

CICS Dynamic File Allocation Facility

Dynamic file allocation eliminates CICS JCL errors as it speeds up initialization and restarts. Online files may be added or removed without interrupting your user community. Scheduling constraints are relaxed and testing becomes more convenient.

CICS Online Dump Display Facility

Formatted online transaction dumps offer immediate access to production and test abends. By reducing your problem resolution cycle, system reliability and programmer productivity is increased. User friendly commands and displays complement diagnostic test facilities.



P. O. Box 18538 • Dallas, TX 75218
 214 324-2848 • Telex 80-4294

Updated Monthly

Datapro Service Looks at Micros

DELRAN, N.J. — Datapro Research Corp. has launched a new reporting service aimed at the microcomputer market.

Called "Datapro Reports on Microcomputers," the service consists of two loose-leaf volumes totaling approximately 2,000 pages that are updated on a monthly basis. Updates include changes in original material, as well as additional information on hardware and software products, a spokesman said.

The service also includes access to the firm's consulting group, via a hotline telephone number, for late-breaking information on new equipment and software.

The publication compares

Rome to Host World Forum On Data Policies

ROME — The Second World Conference on Transborder Data Flow Policies will be held here June 26-29. The conference is being organized by the Intergovernmental Bureau for Informatics (IBI).

The first conference, organized by the IBI in 1980, presented the international community with an opportunity to identify the main economic, legal and sociocultural aspects inherent to transborder data flows, according to an IBI spokesman.

The second conference will attempt to examine fundamental aspects of transborder data flows that are of interest to developing countries; a further objective is to encourage the establishment and adoption of universal principles or to set up mechanisms for the future formulation of principles.

Any individuals or organizations seeking further information on participation or presentation of papers may contact the IBI through the Department of Policies, P. O. Box 10253, 00144 Rome, Italy.

equipment from more than 1,000 vendors and features comparisons of 30 of the most prominent microcomputer systems and 40 of the most popular peripherals, the spokesman noted.

In addition to the report, subscribers will also receive a copy of a survey conducted by Datapro of nearly 6,000 users of microcomputers across the country. The sur-

vey presents user ratings of 126 computers from 57 manufacturers; 19 operating systems; 13 popular software packages; and 90 peripherals.

"Datapro Reports on Microcomputers" costs \$600 per year. Both the service and the included survey will be available in December, Datapro said from 1805 Underwood Blvd., Delran, N.J. 08075.

ANTI-STATIC CARPET MATS

- CARPET TOP, VINYL BACK MATS THAT WORK
- REDUCE STATIC CHARGES BELOW 2000 VOLT LEVEL
- NO GROUND WIRES - NEVER WEARS OUT
- PERFECT FOR USE WITH ALL ELECTRONIC EQUIPMENT
- STAIN, SOIL & SKID RESISTANT
- ALL SIZES & COLORS AVAILABLE IN CUT OR LOOP PILE

CUT PILE COLORS	LOOP PILE COLORS	SIZES	PRICES
BLUE	BLUE	2 x 3	18.50
JADE	GREEN	3 x 4	35.90
SAND	SAND	3 x 5	44.75
RUST	RUST	3 x 6	53.50
GOLD	GOLD	4 x 6	69.90
DK. RED		4 x 8	94.25
BROWN		3 x 10	89.50
DK. GOLD		4 x 10	119.00
DK. GREEN			
DK. BLUE			



THE CPI USER'S GROUP
77 PARK ST. - RIDGEFIELD PARK, N.J. 07660
(201) 641-8000
Everything in Printing Supplies & Furniture
for the Office & Computer Room
QUANTITY DISCOUNTS AVAILABLE

Touch a few of these softkeys

Setup Menu Monitor Menu Simulate Menu Display Menu Run Menu Examine Data Mass Store Basic

and you'll know why HP's new Protocol Analyzer could pay for itself the next time you have a network problem.

Perhaps it's time you took control of your datacomm problems. The minute one of your datacomm interfaces crashes, you're faced with more than inconvenience. A bill for service calls, as you play "vendor roulette" trying to locate the problem, can run into thousands of dollars. If you're faced with a down network, it can cost a hundred times that.

Take control with HP's new 4955A Protocol Analyzer. Its softkey-guided interface lets you troubleshoot your datacomm problems *before* you call in repair personnel. And you can monitor, simulate and trigger from 50 bps to 72 kbps. Avoid vendor fingerpointing by quickly diagnosing DCE/DTE malfunctions and isolating the fault yourself. Nonintrusively monitor network traffic to catch protocol glitches before they turn into full scale problems. Save time bringing new datacomm equipment on-line simulating modems, line, CPU, and/or terminals.

Multiple display formats are dedicated to identifying protocol problems easily at the physical interface, frame, and packet levels. In one format, the 4955A will give you *data simultaneous with lead transitions* so you can see handshaking faults at once.

The HP 4955A supports the major protocols and standard data codes. But what about your own unique protocols and architectures? Our datacomm-enhanced BASIC lets you program sophisticated test routines and perform higher-level protocol analysis. Create statistical displays (tables, graphs, histograms) and perform detailed message manipulation for your own network needs. Add to that the capability of printer output and you have permanent, long-term records of performance. Your efficiency is improved for network planning and expansion.

Communications debugging and troubleshooting are done quickly and easily either on-line or in a post-processing mode. The 63 triggers, the most extensive in the industry, enable you to trap real time so you can catch elusive problems. The intelligent 128K-character capture memory saves you time by eliminating idles without sacrificing timing information. And you've just increased your real data storage!

And the softkeys? They're the best feature! From power-on right through complex measurement sequences, they're dedicated to making your job easy!

In fact, so easy you're presented only with valid choices every time you select a menu setup or change. You don't have to memorize cryptic syntax.

The HP 4955A Protocol Analyzer. It speaks your language. It speaks your network's language. It's your key to rapidly solving network problems in the datacommunications marketplace.



For a technical data sheet, write to Hewlett-Packard, Literature Distribution, 1820 Embarcadero Rd., Palo Alto, California 94304 or for more information, call your local HP sales office listed in the telephone directory white pages. Ask for an HP Instruments Field Engineer.

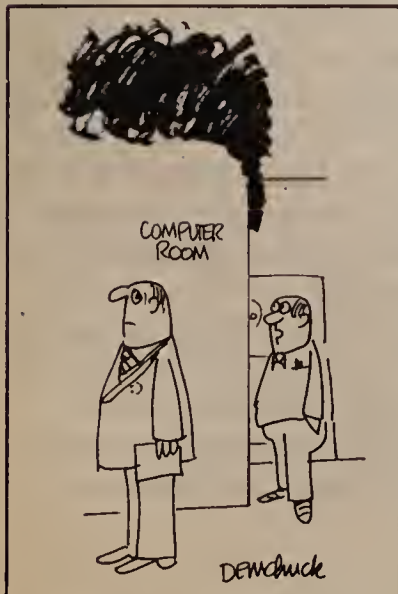
**hp HEWLETT
PACKARD**



HP-IB
SYSTEMS

HP-IB: Not just IEEE-488, but the hardware, documentation and support that delivers the shortest path to a measurement system.

3801301A



'How Attached Were You to Your Computer, AI?'

Officers Elected for 1983-1984 At AIM's Annual Conference

HILTON HEAD, S.C. — Covell Allen, vice-president of the Western Savings and Loan Association of Phoenix, was elected president when the Association of Information Managers for Financial Institutions (AIM) elected its 1983-84 officers during its annual conference held here.

A. Paul Cox Jr., president of Data Systems Corp. of Richmond, Va., was chosen to serve as vice-president of AIM. Both Allen and Cox will serve one-year terms.

AIM members also elected six new representatives to three-year terms on the organization's 16-member governing board. They are Marc DeFano, senior vice-president of the

American Savings and Loan Association of Whittier, Calif.; Howard Hanson, president of On-Line Computer Services of Seattle, Wash.; Dan Lanphear, president of First Chicago Data Corp. of Chicago; Linda M. Martin, senior vice-president of the Valley Federal Savings and Loan Association of Van Nuys, Calif.; Larry Morse, president of Northeast Datacom, Wallingford, Conn.; and Paul Williams, vice-president of Union National Bank in Little Rock, Ark.

An affiliate of the Financial Managers Society, Inc., AIM is a national organization for individuals who develop and operate automated support systems in financial institutions.

Babbage Trustees Name Bauer Foundation Head

MINNEAPOLIS — The trustees of the Charles Babbage Foundation (CBF) here have elected Dr. Walter Bauer as foundation chairman. He is currently chairman of Informatics General Corp., a software and professional services firm he founded in 1962.

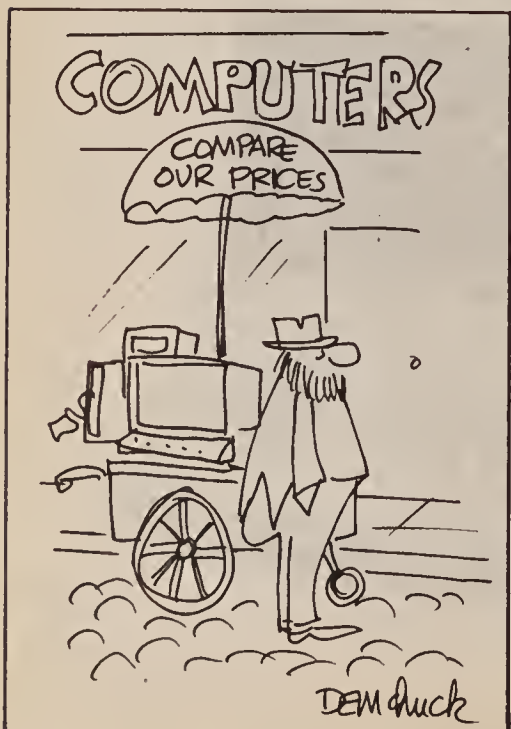
The trustees also recognized Erwin Tomash, the founder of Dataproducts, Corp. and other high-technology firms, for his role in the creation of the Babbage Institute and five years of service as the CBF's chairman. Tomash was elected as Chairman Emeritus.

Elected as foundation president for 1984 was James Birkenstock. Now retired, he was a long-time employee of IBM where he was a senior officer responsible for all phases of management of industrial and intellectual property rights.

Formed in 1978, the CBF supports the activities of the Charles Babbage Institute, an information processing, industry-sponsored center located on the University of Minnesota campus.

The institute encourages the study of technical and socioeconomical aspects of the industry's development.

Both the Charles Babbage Institute and Foundation are located at 104 Walter Library, 117 Pleasant St. S.E., University of Minnesota, Minneapolis, Minn. 55455.



'Diversifying Technology' Theme Of Comtec Convention

SAN FRANCISCO — "Diversifying Technology" is the theme of the 14th Annual Convention of Comtec, an association of professional users and vendors in the computer micrographic industry, which will be held at the Westin Miyako Hotel here Feb. 20-23.

The conference will reportedly feature lectures on the various data processing methods and techniques interfacing with computer micrographics.

Technical presentations on micro-publishing, business graphics, alphanumeric and computer micrographics and scientific graphics will also be offered.

High-technology subjects covered

at the meeting will include imaging art management for electronic publications, turnkey microcomputer-based graphic systems, hardware and software considerations for computer micrographics, computer micrographics and video systems, computer-aided design and computer micrographics and trends in the computer micrographics marketplace.

Registration for the conference is \$295 until Dec. 31 and \$320 after the above date, a conference spokesman said.

Further information is available from Comtec, which can be reached at Suite 200, 100 N. Winchester Blvd., San Jose, Calif. 95128.

See COBOL.

Dick is a COBOL programmer. Dick is bored. Harried. Overworked. Dick struggles with tedious trace and

debugging routines. Non-existent documentation. Mainframe logjams.

Dick is four months behind schedule as a result. And users are angry about long turnaround times. They yell and make Dick upset. They make Dick's boss upset. Nobody is very happy.



See COBOL Run.

Jane is a happy COBOL programmer. She uses ANIMATOR.™ It's a unique Visual Programming™ aid for Micro Focus Level II COBOL.™ It runs on Jane's friendly microcomputer. It makes child's play of mainframe test and maintenance chores.

With ANIMATOR, Jane sees a picture of the program explaining itself. In live action. In COBOL source code. Right at her desk. As ANIMATOR displays the program listing, the cursor tracks the exact execution path. Including subroutine



Morris Cornwell (seated), Cochrane Furniture Co.'s information systems manager, reviews health insurance reports with Neal H. Rhyne, vice-president of finance. The reports help Cochrane evaluate employee needs for new health plan coverage.

Furniture Firm Carves Out In-House Insurance Plan With Turnkey Installation

LINCOLNTON, N.C. — A furniture company here has recently made a name for itself among its employees and health care providers as a top-notch health insurance plan administrator.

At its headquarters here, Cochrane Furniture Co. now processes a monthly average of about 400 health insurance claims for its 700 to 750 full-time employees and their families.

Morris Cornwell, manager of Information Systems, said the company's 1982 decision to self-administer

its employee health insurance plan has dramatically cut benefit costs and simultaneously improved plan efficiency and employee morale.

"We took our first actions to reduce health insurance plan costs in 1977 when we opted for self-insurance and self-funding," Cornwell said.

"Management was very concerned that health insurance premiums, which impact balance sheets as operating expenses, were escalating year after year.

"So to contain costs, we first embraced the idea of a self-funded insurance plan as a proven way to reduce expenses," Cornwell said.

"However, we continued to have a major insurance company administer our plan, which meant we were still paying \$40,000 a year in administrative service charges alone. Yet we were dissatisfied with the service. Finally, we decided that self-administration could improve the plan and reduce costs."

In June 1982, Cochrane installed an Applied Digital Data Systems, Inc. Mentor 4000 minicomputer and CG Data Corp.'s fully automated claims terminal system software to bring administration in-house. CG Sales, out of St. Petersburg, Fla., provided the equipment and software as a turnkey system.

Project Benefits

The projected benefits quickly materialized. Processing is faster — the average claim is now paid within three days of its receipt.

Cochrane's total health insurance plan costs have stabilized. It no longer pays any out-of-pocket administrative costs, which, given inflation, would now exceed its previous \$40,000 annual total.

Though Cochrane has expanded its plan's coverage, administrative efficiencies have enabled the company to hold the line on premium costs.

"The result is that we can offer employees a really good health care plan while containing premium costs shared by employees and the company," Cornwell said.

"With our automated claims-processing system, we feel like we're doing justice to everybody concerned — employees and their families, health care providers and the company.

"Initially, we projected savings would pay for the minicomputer system and software we purchased within one to two years," he added. "But it now appears that the pay-back period will be even shorter."

The furniture manufacturer has a Sperry Corp. computer that runs a comprehensive on-line manufacturing control system for all plants, but it ruled out using this mainframe for insurance claims processing.

The nine-person MIS department had neither the time nor expertise to write the software, according to Cornwell.

Claims for employees at all Cochrane facilities are processed by the

(Continued on Page 68)

branches. The view is precise. Compact. Unambiguous. And there's no waiting for computer time.

Jane can have the program run fast. Or slow. Or stop. All at the touch of a key. This makes it easy to spot problems. Insert fixes. Set breakpoints. Instantly. Because of ANIMATOR's sophisticated debugging commands.

ANIMATOR gives Jane more freedom to innovate too. Her programs sometimes win awards. Yet she always meets schedules. Jane's boss likes this about Jane. Because he doesn't like users to yell at him.

control and prestige back into the central DP function. And nobody yells at him anymore. All thanks to ANIMATOR.

See ANIMATOR now.

Let Micro Focus put your DP shop on the fast track. ANIMATOR makes COBOL programs easy to comprehend. Fun to develop. A snap to maintain. Without the drudgery, your programmers will be happier. They'll do better work. In record time. And your users will probably stand up and cheer.

ANIMATOR runs with Micro Focus Level II COBOL for compatibility with



ANSI '74 High Level COBOL implementations. A mainframe-micro communications link is recommended for downloading mainframe programs.

Write or call for a demo. Or detailed information. Right now.

Run, COBOL, Run!

This DP manager just got a big bonus. Because he doubled productivity. He cleared the backlog. Cut costs. Compressed development cycles. Increased programmer efficiency and satisfaction. Produced terrific applications with faster turnaround times. Put

MICRO FOCUS

2465 East Bayshore Road · Suite 400 · Palo Alto, CA 94303 · (415) 856-4161

System Helps Feedlot Monitor Cattle's Weight

CALEXICO, Calif. — A computer system is helping a California feedlot operator decide when cattle are putting on too much weight.

Cutting back on feed at that point means more appetizing cuts of meat for the consumer and more cost-efficient operation for Hartman & Williams here, one of the oldest feedlot operators in the Imperial Valley.

According to Hartman & Williams manager Tom Remington, a certain amount of fat is desirable because it helps produce tender, flavorful cuts of beef. However, because fat contains more than twice the stored energy of an equal weight of muscle tissue, it takes more feed to produce a pound of fat than it does a pound of lean beef.

Hartman & Williams installed an IBM System/34 in 1980 to keep track of weight gain in proportion to feed. When the rate of gain falls off, the feed is being turned into excess fat instead of lean meat.

"The computer monitors how much the cattle are eating," Remington said.

"It estimates what their gain should be from that consumption. It allows us to determine the point at which, on a cost basis, the animal has reached a point of diminishing returns — the point at which the gain costs more than what it's going to sell for on the market."

Nearly all of the approximately 30,000 head of cattle that pass through the Hartman & Williams

feedlot in a year are part Brahman, selected because they tend to be leaner than other breeds. The cattle weigh about 300 pounds when they arrive. In about nine months, they gain 600 to 700 pounds before being sold to meat packers.

In addition to monitoring weight gain, the computer double checks the records maintained for each lot of cattle in the yard.

As many as 22,000 head of cattle, divided into more than 100 lots, may be in the yard at any one time, Remington said. Feedlot workers record the amount and type of feed delivered to each lot. By comparing records, the computer can point out apparent discrepancies in the feeding schedule, such as when the wrong

formula or amount is delivered to a particular lot.

Remington said he was amazed at the number of errors that showed up in the feeding records once he started to cross-check them with the computer. Cattle feeders operate on a narrow margin, and feeding errors can quickly add up to lost profits.

The IBM system provides a weekly report that lists the average daily consumption of feed, the number of days the cattle have been in the yard, the formula they take, total weight gain and total cost.

Although Hartman & Williams own some of the cattle in the feedlot, most are owned by investors. The computer prepares itemized bills as well as profit and loss statements for each investor. It generates a report listing each individual partner's gain or loss for groups of up to 10 investors.

Hartman & Williams also mixes its own feed. Remington said the computer helps him analyze commodity prices so he can decide which grains or agricultural by-products are the best buys at any given time in a rapidly changing market.

The feedlot uses three different feed formulas, and because some of the ingredients are interchangeable, analyses are very complicated.

"The IBM system can complete an analysis within five minutes, making it feasible to do more analyses more often and have better information to help make major purchasing decisions," Remington said.

Firm Improves Insurance Plan

(Continued from Page 67)

equivalent of one full-time staffer here, where the majority of Cochrane's work force is based.

"We're not using data processing staff to run our system," Cornwell said. "Instead we've trained employees who previously interfaced with the insurance company so no additional staff was required to bring claims processing in-house."

Cornwell said he believes internal administration of health insurance plans is fast becoming an industry trend.

"At a summer 1983 industry meeting, perhaps 75% of the 24 companies were self-insured," he noted. "But only one other company besides Cochrane was handling its own administration. Since then, though, several companies have called to say they're taking this route."

"Another self-insured company, located about 25 miles from us, is purchasing time on our system as a pilot project," Cornwell explained. "A modem links a CRT and a small printer to our system so it can process claims for one of its divisions."

"I don't see us outgrowing this system, though we'll probably add memory, another disk drive and another port for more CRTs," Cornwell said.

"We looked at expansion options closely because we realized we would probably want to build on this new distributive data processing capability," he said.

The Control Concepts CC-3276 terminal has upset Telex, Teletype, Raytheon and Courier.



It wasn't even a contest. That's because Control Concepts leads the competition with its CC-3276 plug-compatible terminal — clearly the most affordable stand-alone controller/display station on the market today. The CC-3276 features full SDLC protocols for use in remote offices, which eliminate clamoring for interactive access to your SNA network. It also features the only integrated 2400 baud dial modem currently available in any 3270 terminal. But that's just the beginning. The Control Concepts Systems

Engineers make system start-up fast and easy. The CC-3276 also comes with a separately addressable printer port as standard equipment, and can be teamed with almost any asynchronous printer for use as a 3287. Try to find a comparable model for the same price. It simply can't be done. For high quality, advanced technology and cost effectiveness, you need look no further than the Control Concepts CC-3276. And the competition knows it. For further information, call toll-free, 1-800-368-3078.

Dairy Uses Micro, Tradition to Manage Herds

LANESBORO, Minn. — On a 750-acre dairy farm in Minnesota, traditional herd management has been combined with modern microcomputer technology to help increase milk production and decrease costs.

"Feed represents as much as 50% of a dairy farm's overhead, and the use of the computer to monitor and regulate the herd's intake compared to its milk production means a significant savings," explained Gary Eide, who, along with his father Glen, owns the Eide farm. "We're achieving a better balance between feed and production, and we're wasting less feed concentrate."

The Eides use an Altos Computer Systems, Inc. 8000-10 microcomputer, combined with Northhouse Industries, Inc.'s (NII) Herdstar, a dairy management software package. The system tracks breeding and calving as well as the amount of feed each cow gets to achieve its milking peak.

The computer is kept in the main house, with additional terminals in the milk house, where the cows are fed, and the milking parlor, where they are milked. Using Digital Research, Inc.'s MP/M multiuser operating system, the main house computer terminal can be in operation checking on weekly production while a dairyman in the milk house is determining the status of an individual cow's daily feed allotment.

Protection From the Cold

Because of the especially harsh environment in the milking parlor, a membrane keyboard terminal with an LCD display is used there. This adds protection from water and dust to the unit. Underground cables connect terminals to the main house computer, providing insurance against damage during the severe cold and ice storms of Minnesota winters.

A traditional milk herd management method segregates cows by various groupings — one such grouping is production (measured in pounds of milk) — so that high producers (75 to 100 or more pounds of milk per day) can be fed appropriate amounts of grain, while lower producers receive less.

A large farm may have three or four such groupings, requiring more barns, sleeping and feeding facilities than the Eides can provide. So, instead of depending on physical segregation of the milk animals, the Eides monitor the herd with Herdstar software and the Altos computer.

NII developed the Herdstar software over a period of three to four years. Dr. Richard Northhouse, founder of NII and Compco Farm Computer Systems, had made several visits over the course of a year to the Eide farm to study the specifics of its operation before recommending the present system.

The main use of the system, with Herdstar's Herd Manager program, is to track the breeding, calving and dry periods of each milk cow. However, the software also handles feed rationing and requirements.

Each cow in the herd is assigned a number and wears an electronic transponder around its neck. Sensors in each of the six feeding stalls react to the transponder, sending a coded

signal to the computer. This identification is critical to the success of the system because it allows the computer to recognize each animal when it appears in a feeding stall.

A feeding record is kept in the computer's 10M-byte hard disk memory for each animal. The amount and type of feed is determined based on National Research Council nutritional guidelines and the cow's milk production. For body maintenance and quality milk production, each cow's protein intake must be watched closely.

"Even though the automatic herd feeders are over 600 feet from our Altos computer, we can actually sit at the terminal display and check which cow is in which feeder at any

moment," Eide said. "The animal is identified by number on the screen, and the brightness level of that number indicates whether the cow will be fed this time or not."

"The amount of feed is controlled by the Herdstar computer program, and the system operates 24 hours a day, seven days a week," he added. "We think of it as our 24-hour hired hand."

The microcomputer maintains feed records on each cow in the Eides' herd for about 3½ years. This aids the family in cost analysis, profit and loss determination and maintenance of a healthy, productive herd.

Since cows must be bred periodically to maintain their milk producing capabilities, the program also re-

ports on the animal's ovulation cycle, determines proper breeding and expected calving dates, predicts when the cows should dry up and performs other aspects of animal maintenance.

A software program known as Reproduction Manager, also from NII, provides details on which cows were "mated" to which bulls. The animals are bred through artificial insemination, and the bull sires are chosen from a catalog listing.

One other NII software program Eide uses, the Heifer Manager, also helps him track individual calves from birth through first breeding (usually at 12 to 14 months of age).

"We use the computer twice a day," Eide said. "It's as important to our operations as tractors and silos."

Zero to 750 in .003 seconds.



There's only one electronic mail system which can send your messages to 750 cities all over the world—at lightning fast speed.

It's called the QUIK-COMM™ System. And you can get it from General Electric Information Services Company.

Why does QUIK-COMM™ cover the world better than any other system?

Because it runs on the GE Information Services Network—the world's biggest computer network offering business solutions.

That's why you can also integrate it with many of your existing computer applications to produce data about sales, marketing, financial and other activities.

All from the same terminal or computer.

QUIK-COMM™ is also very compatible. You can send messages from a wide range of hardware, including mainframes, minicomputers, microcomputers, word processors, CRT devices and portable terminals.

What's more, our staff of 5,000 experts is on call to serve you all over the world—even in distant locations like Saudi Arabia, Australia or Japan. They can implement quicker than anybody else.

No wonder 66% of the Fortune 500 already use the network.

Interested? Send us a message by electronic mail.*

Or call GE Information Services at 800-638-8730.

Or, if you must rely on conventional mail, fill out the coupon for more details.

But don't delay. Once you experience the immediacy of electronic mail between the most far-flung locations, you'll regret every 0.003 seconds you waited.

To: GE Information Services Company
Manager Office Systems (TOCI)
401 North Washington Street
Rockville, Maryland 20850

- ☐ Please send me your brochure on the QUIK-COMM™ System.
☐ Please have one of your account representatives call on me.

Name _____ Title _____
Company _____
Street _____
City _____ State _____ Zip _____
Tel. no. _____ Telex _____

CW11/83



INFORMATION SERVICES

General Electric Information Services Company

*You can use any TTY device. In the U.S. call 800-638-8369. Listen for the computer tone and insert the telephone into the coupler. Press the "H" key several times, then the carriage return key. The system will then request that you enter a user number. Enter RPO61100, MAIL. The system will then prompt you for further information to start using the QUIK-COMM system right away.

Seminar on Preventing DP Crime Set This Week in Paris

PARIS — The Institut de Formation Interbancaire is sponsoring an international seminar on "Security for Computer Crime Prevention," which is taking place Nov. 17-18 in the George V Hotel here. DP crime specialist Donn B. Parker from SRI International, Inc., Menlo Park, Calif., will conduct the seminar.

The seminar objective is to provide the latest safeguarding methods and controls in an information age context based on actual losses from computer crime. The program will be divided into three sections:

- Identified crime — funds

transfer, program falsification, automated teller machine attacks and credit card fraud.

- Prevention and control methods — physical, technical and human controls; security procedures; investigation methods; and staff training.

- Evolution — increase in crime and risk-reduction efforts.

The seminar costs \$445. This includes conference papers and refreshments during breaks and lunches. More information is available from the Office de Recherche d'Organisation et de Securite, 42 Blvd. Pasteur, 75015 Paris, France.

TI to Sponsor and Supply Products to U.S. Ski Team

AUSTIN, Texas — Texas Instruments, Inc. has announced its official sponsorship of the U.S. Ski Team. TI will supply the team with an array of computing products, including a multiuser minicomputer system, personal computers, printers, portable terminals and home computers.

"We're excited about incorporating computing power into our growing and active organization," said Inez Aimee, the U.S. Ski Team's executive director. "The computers will help us receive critical information faster and give us access to new data that will help our athletes keep that competitive edge."

"One of the applications we're

planning includes communicating with the U.S. Olympic Committee's computer in Colorado Springs, Colo., for various functions ranging from accounting to athlete information," Aimee said. "In addition, we're considering the possibility of interfacing with equipment at the Olympic Training Center in Colorado Springs. We will look at using the TI computers for psychological testing, sports medicine information and computerized testing of both skiing techniques and equipment."

The minicomputer system will be used by the Ski Team administration at its headquarters in Park City, Utah, to handle the day-to-day operations of the team. These include such tasks as accounting, donation management, tracking the activities of athletes, tabulation of race results, operation of the Ski Team press information office and the storing and transmitting of race results.

The team coaches and office staff will use the TI Professional Computer for managing individual data bases, mailing lists and word processing.

Portable terminals will be taken on the road to help the team keep up with its education while training and while on location at World Cup and Olympic events.

Advisory Group Seeking Names For OA Awards

WASHINGTON, D.C. — Nominations for the 1984 Federal Office Systems Expo (Fose) Office Automation Achievement Award for the commercial sector are being sought by Fose's Commercial Program Advisory Committee.

Eligible individuals must have implemented office automation systems within their organizations that have increased professional productivity, achieved cost savings, provided a useful product that could be adapted by others or lead to new business opportunities, the Fose committee representative said.

The committee is particularly interested in achievements in the areas of decision support systems, professional and executive training, information centers, integrated communications strategies, wide and local-area networking and the integration of microcomputers with mainframes and minicomputers.

Nominations for the Office Automation Achievement Award, which will be presented at the 1984 Federal Office Systems Expo to be held here March 19-22 at the Washington, D.C. Convention Center, must include the name, address and telephone number of the nominee. Submissions must also include a description of the project and a summary of the results, the committee spokesman said.

Nominations must be in by Jan. 31, and more information is available from the conference sponsor, National Trade Productions, Inc., at 9418 Annapolis Road, Lanham, Md. 20706.

MORE WORK STATION FLEXIBILITY WITH TERM-TRONICS' NEW 3270 INFORMATION DISPLAY SYSTEM



PLUS NETWORK FLEXIBILITY AND MULTI-CONFIGURATIONS OF:

- LARGE CLUSTER
- SMALL CLUSTER
- STANDALONE
- COLOR CRT

If you're having trouble finding an advanced display system that's easy to use and maneuver, relax and try the TERM-TRONICS 3270 INFORMATION DISPLAY SYSTEM. It's the most flexible, cost-effective, plug-compatible alternative available for the IBM 3270 remote network user.

Each 3270 display communicates with the IBM communications processor at speeds of up to

9600 bps via the standard binary synchronous (BSC) line protocol.

The 3270 comes standard with the P31 green phosphor display. Color and amber monitors are available as options. The monitor is adjustable and the keyboard is detachable for operator comfort, and the system can be arranged to compensate for ambient lighting conditions.

When it comes to network and

user flexibility, TERM-TRONICS will bend over backwards to satisfy. Ask your TERM-TRONICS representative about our complete line of 3270 and multiprotocol displays.



TERM-TRONICS INCORPORATED

7408 Trade Street
San Diego, CA 92121
(619) 271-1770

For Upper Management

Deltak Announces Video Courses

NAPERVILLE, Ill. — Deltak, Inc. has announced four video courses:

- "Increasing DP Productivity," a video journal composed of three courses, offering a view of current DP productivity problems and potential solutions.

This series was designed for upper management inside and outside of the DP department, development support teams, systems analysts and project managers, Deltak said.

The courses are available for an average rental fee of \$50 to \$125/mo per course, depending on volume. Purchase price is \$1,750 per course.

- "The Micro/Mainframe Link," a video magazine that provides a look at the problems and opportunities associated with linking stand-alone microcomputers with corporate mainframes.

This is one tape in a series of half-hour videotapes focusing on the latest developments in information technology, Deltak said.

Program rentals average \$50 to \$125/mo per program, depending on volume. Purchase price is \$450 each.

- "VSE, DOS/VSE and DOS/VS for Application Programmers" is a series presented through videotapes, audiotapes and text.

The five training courses that complete this series include "The VSE Linkage Editor," "Using VSE Libraries and Cataloged Procedures," "VSE Utility Programs," "VSE Sort/Merge Utility" and "VSE Debugging."

Students must have access to Apple Computer, Inc.'s 48K-byte Apple II+ with two disk drives and an Apple language system to complete the training. It was designed for self-instruction, and the microcomputer encourages this method by diagnosing and prescribing the training needed, according to the vendor.

Average rental for courses is \$50 to \$125/mo per course, depending on volume. Purchase price is \$1,750 each.

- "IMS/VS Data Communications Programming," a four-course series that analyzes three types of on-line application programs: batch message processing, message processing conversational and message processing non-conversational.

A working knowledge of Cobol, PL/I or assembler and DL/1 application programming is required for this series. The average rental fee for this course is \$50 to \$125/mo. Purchase price is \$1,750.

Further information on the above products is available from Deltak, East/West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

VAX™ USERS!

NOW GET SPREADSHEET AND GRAPHICS IN ONE PACKAGE.

• Full business graphics • Advanced features • Affordable price

GRAPHIC OUTLOOK™

from STONE MOUNTAIN COMPUTING

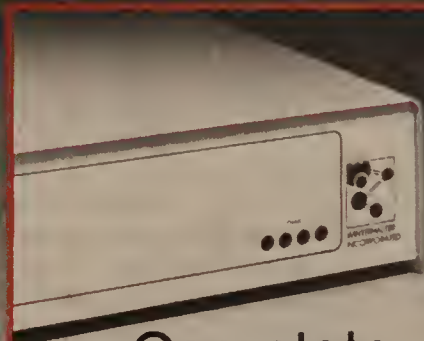
1096 Cambridge Dr.

Santa Barbara, CA 93111 (805) 964-9101

VAX is a trademark of Digital Equipment Corporation.

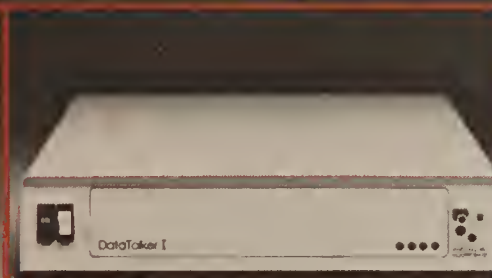


Finally, micro-to-mainframe communication that's:



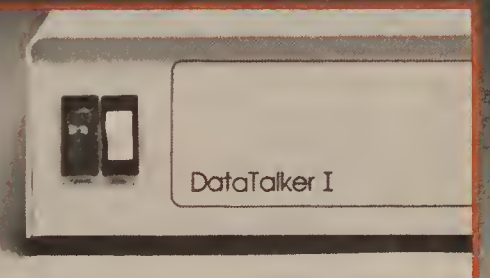
Complete

With 3270 and 2780/3780 using the full Bisync protocol.



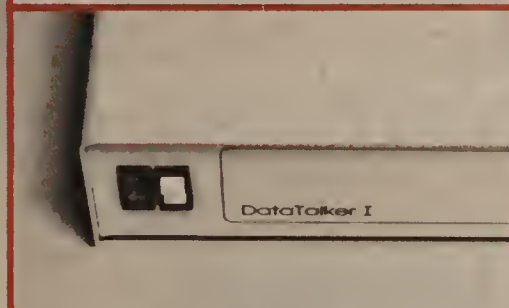
Programmable

Interface custom applications to the host.



Configurable

Modify the protocol to your specific needs.



Upgradable

Works with most microcomputers.



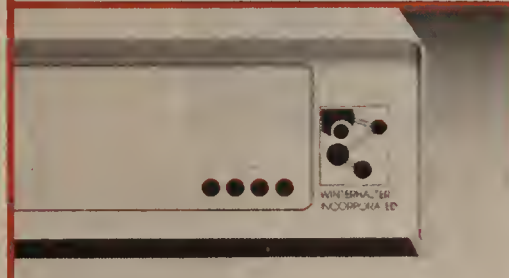
Hardworking

Relieves all micro overhead and overload.



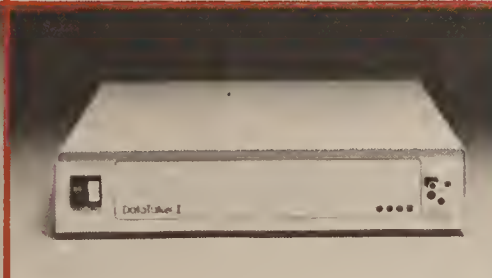
Experienced

Emulation software proven over 6 years of customer use.



Friendly

Complete, clear documentation.



Durable

Engineered for reliable service.



Affordable

The best part of all.

\$995

Our DataTalker™ intelligent front-end processor allows your micro to emulate most IBM terminal systems. Yet it retails for about half of what you'd pay for conventional protocol conversion, software or hardware.

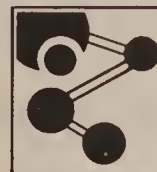
How do we know so much about micro-to-mainframe communications? Because we've been helping computer manufacturers solve their communications problems since 1978.

Ready to talk?

Call and ask for our Marketing Support Group. Or send in the coupon.

Either way, you'll find we speak your language. We welcome dealer/distributor inquiries.

Call 1-800-321-7785.



TM

DataTalker

COMDEX/Fall '83

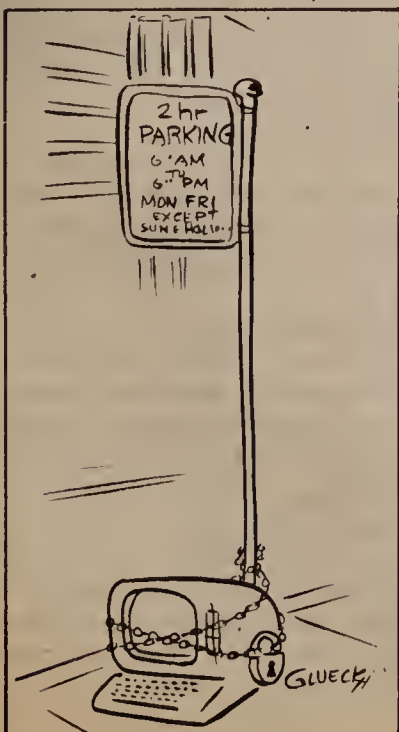
Hilton Hotel, Booth 7601

Tell me more about DataTalker.

C3113

Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____
 Phone _____

Winterhalter, Incorporated
 P.O. Box 2180, Ann Arbor, Michigan 48106
 313/662-2002 TWX 810-233-2423



Calendar

Week of Nov. 20

Nov. 24, Washington, D.C. — **Telephone Bypass Technologies and Economics.** Contact: Telestrategies, Inc., 6842 Elm St., Box 874, McLean, Va. 22101.

Week of Nov. 27

Nov. 28, Denver — **Structured Systems Development.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28, New York — **Computer Acquisition and Disposition.** Contact: 20th Century Systems, 647 E. Carpenter Drive, Palatine, Ill.

60067.

Nov. 28, San Francisco — **Artificial Intelligence.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 29-Dec. 1 in San Francisco.

Nov. 28-29, Chicago — **Data Communication: Advanced Concepts, Products and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-29, San Francisco — **Introduction to the Tools of Structured Design.** Contact: Yourdon, Inc., 1133 Ave.

of the Americas, New York, N.Y. 10036.

Nov. 28-29, Orlando, Fla. — **How to Manage Data and Information as a Resource.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Nov. 28-29, Salt Lake City, Utah — **Systematic Software Testing.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-29, Atlantic City, N.J. — **Software Quality Assurance and Validation.** Contact: Education Foundation of the Data Processing Manage-

ment Association, P.O. Box 3608, Department SQA, Torrance, Calif. 90510.

Nov. 28-29, New York — **Management Implications of Structured Techniques for Microprocessors.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-29, Denver — **Introduction to TSO/ISPE/SDSF.** Contact: Steve Comstock, 256A S. Monaco Pkwy., Denver, Colo. 80224.

Nov. 28-30, Houston — **Data Base Management Systems: Concepts and Guidelines.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Parsippany, N.J. — **Data Processing for the Non-DP Executive.** Contact: Chubb Institute, 8 Sylvan Way, Parsippany, N.J. 07054.

Nov. 28-30, Los Angeles — **Data Communication: Effective Network Design.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Denver — **Data Communications Systems.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Nov. 28-30, Atlanta — **Data Base Management Systems: A Comparative Analy-**

sis of General-Purpose Systems. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Minneapolis — **Micro and Home Computers: Technology and Applications.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 28-30, Philadelphia — **Personal Computers: Strategies for Managing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Chicago — **Structured Analysis for Users.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-30, Washington, D.C. — **Computer-Generated Business Graphics for Today's Manager.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Arlington, Va. — **Network Communications Protocols.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Nov. 28-30, Chicago — **Microcomputers: A Guide to Selection and Application.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Chicago — **DOS/VSE Job Control Language.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-30, Washington, D.C. — **Distributed Systems Designs: Micros to Mainframes.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Phoenix — **Personal Computers and Networking.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Nov. 28-30, San Francisco — **Data Base Management Systems for Micros and Minis.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Denver — **Dbase II for the PC User.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Nov. 28-30, Chicago — **Information Systems Modeling, Analysis and Planning.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-30, Hartford, Conn. — **Unix.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif.

(Continued on Page 74)

David Recommends Digital Terminals

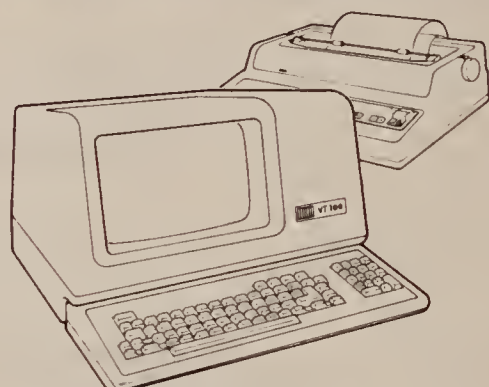
David Jamison Carlyle Recommends Digital Terminals.

For video displays and printers, there's no name like Digital.

The VT 100 family of video terminals (VT100, 101, 102 and 131) offers an exceptional set of standard features and options.

And for printing, the LA 100 (Letterprinter 100) combines a full-featured teleprinter with the flexibility to print letter-quality (at 30 cps), draft (at 240 cps) and even bit map graphics—all with one terminal.

DJC stocks Digital, both video and printer terminals. So when it's terminals you need, call DJC, and ask for Digital.



Call or send for DJC's 1983 Terminals Comparison Chart, as seen in Computer Decisions.

THE DAVID JAMISON
CARLYLE CORPORATION
5700 Buckingham Parkway
Culver City, CA 90230

New Jersey	(201) 780-0802
	(800) 526-2823
Illinois	(312) 790-4466
Texas	(713) 721-4387
Colorado	(303) 426-9508
Hawaii	(808) 531-5136
California:	
San Francisco	(415) 254-9550
Los Angeles	(213) 410-9250
Irvine	(714) 851-5011



THE DAVID JAMISON
CARLYLE CORPORATION

Introducing the Most POWERFUL General Ledger Software Solution for the VAX

What is MAPS/GL?

MAPS/GL is a comprehensive general ledger/financial management system for VAX minicomputers, incorporating general ledger accounting, financial control, budgeting and advanced reporting functions.

Designed for today's powerful, interactive minicomputers and to be linked with MAPS/MODEL and MAPS/GRAPH, Ross' financial modeling and business graphics packages, MAPS/GL brings you a truly interactive and integrated financial management software system.

All MAPS products are available for license or via ROSS/NET remote computing and are backed

with 11 years experience in customer and product support.

All the Flexibility You'll Ever Need.

You can tailor MAPS/GL to your individual needs, controlling accounting structures, organizational roll-ups and reporting specifications. As your company grows and your needs change, you can change your system to adapt.

Its powerful but easy to use report writer brings flexibility to your daily needs as well. Ad hoc reporting from MAPS/GL's financial database can solve your special information needs.

MAPS from Ross Systems. The single source for integrated, interactive financial management software.

DEC and VAX are trademarks of Digital Equipment Corporation. MAPS and ROSS/NET are trademarks of Ross Systems, Inc.

MAPS/GL was developed by Price Waterhouse under the name "FM80" and adapted for the VAX by Ross Systems, Inc., with the support to keep MAPS/GL current with new FM80 releases. Price Waterhouse markets FM80 on other computers.

MAPSGLTM

from Ross Systems

Financial Software Solutions

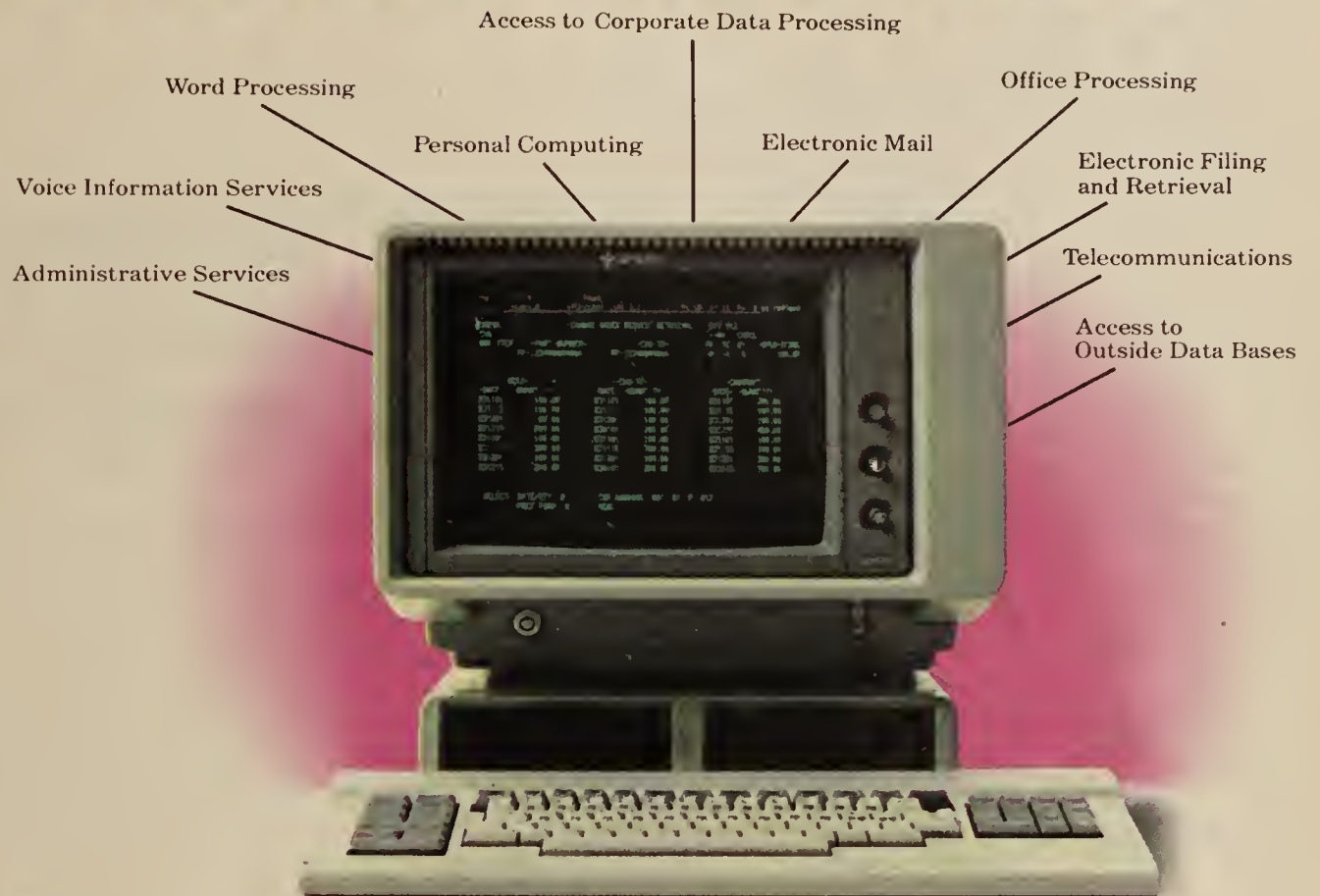
DISTRICT OFFICES:
Palo Alto, CA
San Francisco, CA
Los Angeles, CA
Dallas, TX
New York, NY

CORPORATE HEADQUARTERS
1860 Embarcadero Road
Palo Alto, CA 94303
(415) 856-1100



SPERRYLINK™

OFFICE SYSTEM



The office information system that puts the mainframe into the mainstream.

The SPERRYLINK Office System.

It's a personal computer. Time manager. Word processor. Data processor. Link to the corporation, and to the world outside. And it's a critical link to the wealth and immediacy of mainframe information, and the means to project it into the minute-by-minute business day.

And most importantly, any desk station can be any and all of these things, as intelligent as you want it to be—whenever and wherever the need arises.

When new needs arise, SPERRYLINK will rise to the challenge. Re-adapting as your company grows.

This is the SPERRYLINK System: built by people who see the mainframe not as a monolith, but as a readily accessible resource.

A system beyond conventional ideas of office automation. Beyond words and numbers, voice and image.

Because it doesn't just help people work better.

It helps people work together.

Information. Not automation.

SPERRYLINK™

OFFICE SYSTEM

Sperry Corporation, Computer Systems, Department 100,
P.O. Box 500, Blue Bell, PA 19424

Use this coupon for more information. Or call toll-free:

800-547-8362 (9 a.m. to 5 p.m. E.D.T.).

© Sperry Corporation 1983 SPERRYLINK is a trademark of Sperry Corporation.

CW11/14-11

Name _____ Title _____

Company _____

Address _____

City _____ State _____ ZIP _____

Telephone _____

We understand how important it is to listen.



Calendar

(Continued from Page 72)

92705.
Nov. 28-30, San Francisco — **Advanced DP Management: Methods and Techniques in the '80s.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 28-Dec. 2, Detroit — **Structured Analysis and Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 28-Dec. 2 in Indianapolis.

Nov. 28-Dec. 2, Las Vegas — **Comdex/Fall.** Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

Nov. 28-Dec. 2, Fort Lauderdale, Fla. — **How to Increase the Productivity of Computer People, Including Implications of Office Automation for the User as a Programmer and Systems Developer.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

Nov. 28-Dec. 2, Anaheim, Calif. — **Structured Analysis and System Specification Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 28-Dec. 2 in Atlanta and in Washington, D.C.

Nov. 28-Dec. 2, Atlanta — **Structured Systems Design/Structured Program Design Combined Course.** Contact: Georganna Carson, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

Nov. 28-Dec. 2, Chicago — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, Seattle — **Auditing in the Contemporary Computer Environment.** Contact: Marge Umor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

Nov. 28-Dec. 2, San Francisco — **Structured Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, Englewood Cliffs, N.J. — **Effective Data Base Design.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Nov. 28-Dec. 2, Denver — **Structured Analysis for Real-Time Systems.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, Rochester, N.Y. — **Structured Analysis Workshop.** Contact: Structured Methods, Inc., 7 W. 18th St., New York, N.Y.

10011.
Nov. 28-Dec. 2, Chicago — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 28-Dec. 2 in Houston.

Nov. 28-Dec. 2, New Orleans — **System Resource Planning and Selection.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Nov. 28-Dec. 2, Houston — **CICS/VS Macro-Level Coding.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, San Francisco — **Project Planning and Control Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held Nov. 28-Dec. 2 in Chicago.

Nov. 28-Dec. 2, Boston — **Auditing Structured Analysis and Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, San Francisco — **Computer Performance Measurement Capacity Planning.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 28-Dec. 2, Phoenix — **IMS Application Programming Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-29, San Francisco — **Stress Management.** Contact: Registrar, Control Data Management Institute, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 28-Dec. 2, Boston — **CICS/VS Command-Level**

We've always said SuperCalc® is the world's most useable spreadsheet.

At first, all spreadsheets seem to give you about the same things. Until you put them to work. Then you'll find out if they do everything you expected. Or make you do everything the hard way.

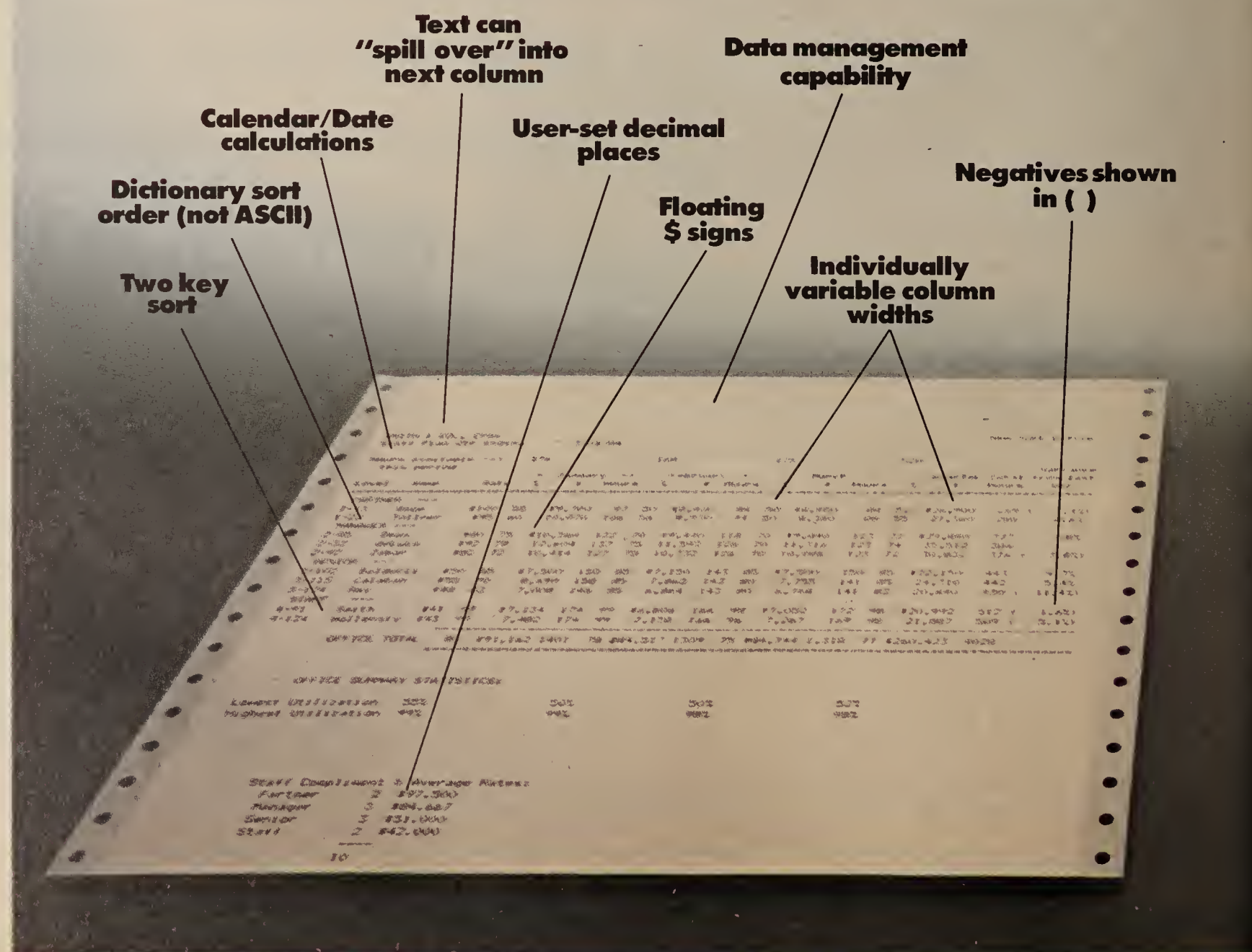
You know what makes the difference? It's not just having the newest, whizziest features, but what those features actually do for you in the real world. And that's the whole idea behind SuperCalc and SuperCalc2. Because they've been designed to work with you in a natural, intuitive way.

What we're really talking about here is useability. When you get right down to it, it's not any one big thing, but a combination of little things. Like the number of keystrokes it takes to get a job done. Or the effort it takes to switch from one function to another. Maybe a few keystrokes here and there doesn't seem like much of a difference. Or having to change disks to plot a graph. But when you multiply those little things by the thousands of times you do them, they make all the difference in the world.

Even the size of the spreadsheet is

important. Some programs promise you a huge area to work with. Unfortunately, they can use so much of the computer's available memory just keeping track of all the blank cells that you're left with only a handful. But we've designed SuperCalc to give you the largest useable spreadsheet.

If you look at the printout below, you'll see a lot more examples of what we mean. And we think you'll realize why this is the most useable spreadsheet in the world.



Calendar

Coding. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 28-Dec. 2, Chicago — **IMS Logical Data Base Design and Implementation.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 29, New York — **Technology Briefing.** Contact: 20th Century Systems, 647 E. Carpenter Drive, Palatine, Ill. 60067.

Nov. 29-30, San Francisco — **Effective Communication Skills for DP Professionals.** Contact: Registrar, Control Data Management Institute, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 29-30, New York — **Strategic Redistribution of Services and Work by Computer.** Contact: The Conference Board, 845 Third Ave., New York, N.Y. 10022.

Nov. 29-Dec. 1, Arlington,

Va. — **SAS Macro Language Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Nov. 29-Dec. 1, Minneapolis — **Data Communications: Network, Design and Optimization.** Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 29-Dec. 1, San Francisco — **Computer Networks.** Contact: Technology

Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Nov. 29-Dec. 2, Washington, D.C. — **Data Base Management Systems: Mini, Micro and Distributed Applications.** Contact: Ruth Dordick, Integrated Computer Systems, 6305 Arizona Place, Los Angeles, Calif. 90045.

Nov. 29-Dec. 2, Washington, D.C. — **Data Communi-**

cations: Components, Systems and Networks. Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 29-Dec. 2, Atlanta — **System Administration and Performance Monitoring for Honeywell Large System Users.** Contact: Technology Information Systems, Inc., 2305 E. Lincoln Drive, Phoenix, Ariz. 85016.

Nov. 30, New York — **Contract Negotiations.** Contact: 20th Century Systems, 647 E. Carpenter Drive, Palatine, Ill. 60067.

Nov. 30-Dec. 2, Washington, D.C. — **Software Quality Assurance.** Contact: Registrar, Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

Nov. 30-Dec. 2, Washington, D.C. — **Robotics and Artificial Intelligence.** Contact: Manufacturing Productivity Center, U.S. Professional Development Institute, Robotics/Artificial Intelligence, Department AB, 1805 Powder Mill Road, Silver Spring, Md. 20903.

Nov. 30-Dec. 2, Arlington, Va. — **SAS Basic Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Nov. 30-Dec. 2, Washington, D.C. — **Managing Microcomputer Systems.** Contact: U.S. Professional Development Institute, Managing Microcomputers, Department A, 1805 Powder Mill Road, Silver Spring, Md. 20903.

Nov. 30-Dec. 2, Orlando, Fla. — **How to Build and Use a Data and Information Resource Directory.** Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Nov. 30-Dec. 2, Philadelphia — **Systems Analysis and Design: Concepts and Effective Practice.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

(Continued on Page 76)

Now you can draw your own conclusions. SuperCalc³.

Now we're introducing our newest version, SuperCalc3, which comes complete with the kind of graphics you'd expect to find in a program that does everything else so well. We give you full color. And presentation quality. Plus eight different type styles to choose from. And new financial features like internal rate of return. We've even integrated all these functions onto one single disk. Which means you don't have to change disks all the time. Or settle for a weak spreadsheet and low-resolution graphics just for the sake of getting

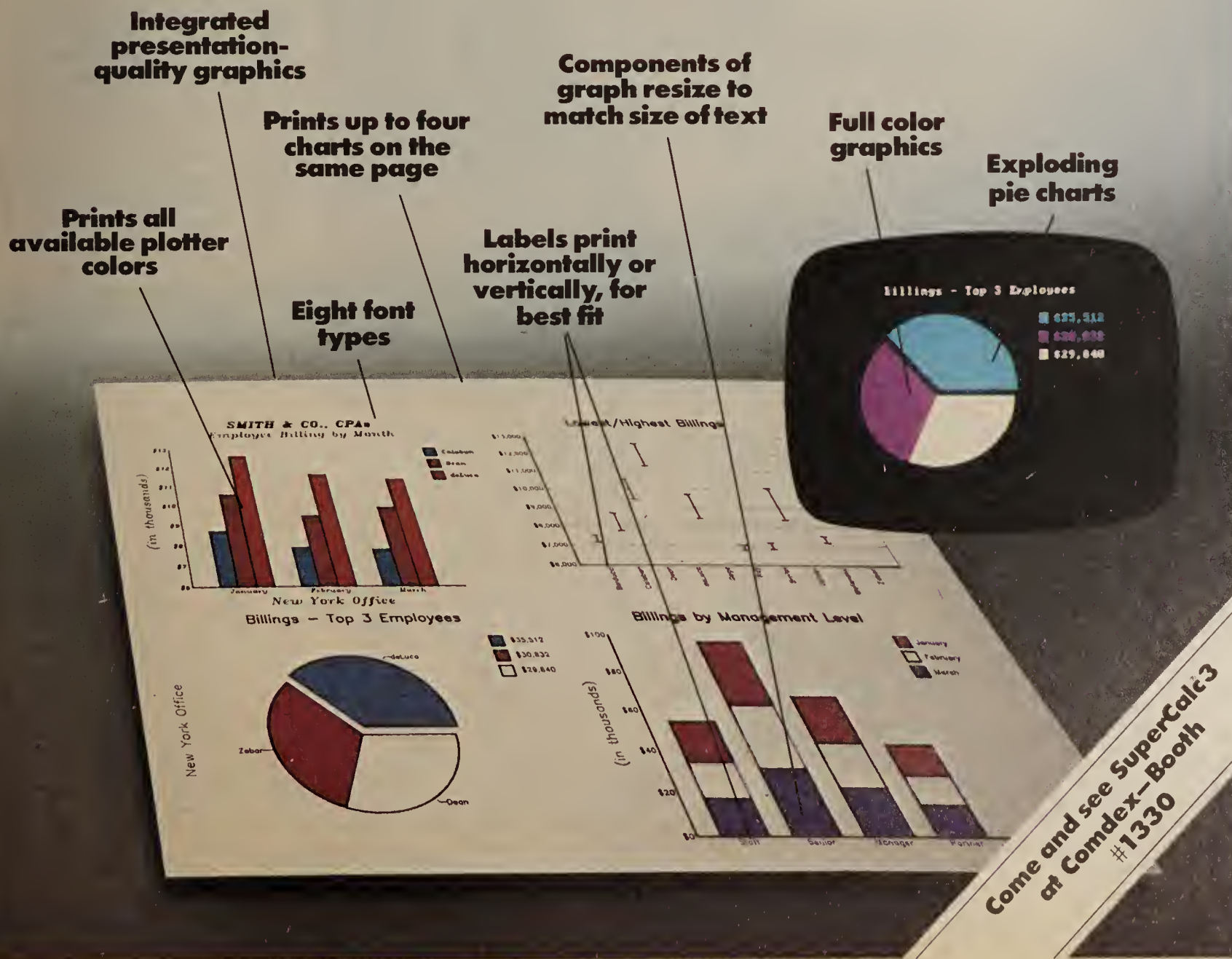
both in the same package.

As you might expect, we've made SuperCalc3 100% compatible with SuperCalc and SuperCalc2. So you can move up to it whenever you're ready. You can even convert your VisiCalc files. The SuperCalc family is available for CP/M, CP/M-86, Concurrent CP/M-86, MP/M, MS-DOS and PC-DOS operating systems. Right now, SuperCalc3 is available for the IBM PC, PC XT and IBM PC compatibles. It's only \$395. And soon it'll be available for a lot more personal computers.

SuperCalc3. When you're really serious about spreadsheets, this is the one you'll wind up using. But don't take our word for it. Go try SuperCalc3 at your computer store today. And draw your own conclusions.

CP/M® CP/M-86® Concurrent CP/M-86, and MP/M® are trademarks of Digital Research. MS-DOS is a trademark of Microsoft Corporation. IBM® is a trademark of International Business Machines Corporation. VisiCalc® is a trademark of VisiCorp. © 1983 Sorcim Corporation.

SuperCalc³
SORCIM
2310 Lundy Avenue San Jose, CA 95131
(408) 942-1727



'Relief? I Spell It... C-O-M-P-U-T-E-R.'

Calendar

(Continued from Page 75)

Nov. 30-Dec. 2, Washington, D.C. — **Capacity Management Forum.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Nov. 30-Dec. 2, Seattle — **Local-Area Networks.** Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

Nov. 30-Dec. 2, Chicago — **Computer Performance Measurements and Capacity Planning: Tools and Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Nov. 30-Dec. 2, San Francisco — **Office Automation: Concepts, Systems and Implementation.** Contact: Registrar, Control Data Management Institute, 6003

Executive Blvd., Rockville, Md. 20852.

Nov. 30-Dec. 2, Denver — **MVS, JCL and Utilities.** Contact: Steve Comstock, 256A S. Monaco Pkwy., Denver, Colo. 80224.

Nov. 30-Dec. 2, San Francisco — **Managing Proliferation of Small Computers.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Nov. 30-Dec. 2, Chicago — **Basic Systems Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Nov. 30-Dec. 2, Washington, D.C. — **Simulation Modeling for Decision Making.** Contact: The Institute for Professional Education, Suite 303, 1515 N. Court House Road, Arlington, Va. 22201.

Nov. 30-Dec. 2, New York

— **DL/1 Application Programming.** Contact: Kaaren Perez, Comped, 10 E. 21st St., New York, N.Y. 10010.

Report Outlines Ways to Guard Against DP Theft

NEW YORK — In a special report called "Safeguarding Your Business Against Theft and Vandalism," the Research Institute of America (RIA) estimates that \$70 billion is lost annually to white-collar computer-related crimes, fraud and embezzlement, and another \$30 billion each year disappears to theft, inventory shrinkage and unidentified pilferage.

Many companies refuse to believe that they could have a serious security problem, the report says. The common reaction to such crime reports, according to consultants surveyed in the report, is always "but our employees wouldn't steal."

While this is sometimes true, security expert Norman Jaspán maintains that when his team of consultants visit a new corporate client, they know they have a better than 50% chance of uncovering a major case of theft or financial manipulation and a 75% chance of finding "costly malpractices."

The RIA report offers an overview of the various steps that go into a loss prevention program and provides guidelines for reviewing present practices and procedures to determine where the weak links might be, a spokesman said.

The report is available for \$25 from RIA's Membership Service Group, Mount Kisco, N.Y. 10549.

Simultaneous

The Adminet Data Over Voice Modem Now a Data Option for the Analog PBX

simultaneous voice & data transmission with independent access over a single twisted pair / a local area retrofit data option for any analog PBX / 0 to 9600 bps / asynchronous full or half duplex call or write for details / Adminet Inc 27 Goulburn Avenue Ottawa Canada K1N 8C7 / Telephone (613) 230 7027



The Benchmark Of Excellence In Program Management... Library Control Systems™ by Pansophic For Unprecedented Software Mobility, Control, and Productivity.

It's a fact—Pansophic's Library Control Systems (LCS™) are the criteria of excellence against which other library products are measured. LCS™ allows you to control your program development center without compromising programmer productivity. Keeping pace with the evolution of your IBM ICCF, CICS, TSO, ISPF, and native VM.

LCS™ covers the spectrum of program management with three synergistic products—PANVALET, PANEXEC, and O-W-L. To manage software resources more effectively, PANVALET stores, maintains and protects source programs from unauthorized access. PANEXEC provides the same functions for executable programs, offering audit trail and cross-reference information while tracking program activity. Together PANVALET and PANEXEC form a network of organization and control for your source program and executable libraries, and offer the basis for on-line change management.

With the addition of O-W-L, on-line development capabilities can be added to the superb control of LCS™. Human-engineered for natural dialogue between man and machine, O-W-L offers multi-level security for your source program library, and features a full complement of prompts and text-editing facilities. Blending productivity with control, O-W-L brings an entirely new dimension to the LCS™ concept.

Like all of our peak performance products, LCS™ is backed with the conscientious service, responsive training, award-winning documentation, and active user group support that has become Pansophic's trademark. Simply send in the coupon below for complete information and a personal demonstration of the LCS™ package. We promise you a display of program management that yields productivity and control...today, tomorrow, and for years to come.

Yes, Pansophic—I would like to know more about LCS™ Program Management.

Please: ☐ Send more information.
☐ Have a Sales Representative contact me.

Name _____ Title _____
Company _____ Telephone _____
Address _____ State _____ Zip _____
City _____
CPU(s) Installed _____
Operating System _____

MAIL TO: Pansophic Systems, Inc., 709 Enterprise Drive, Dept. C529
Oak Brook, Illinois 60521. 1-800/323-7335, In Illinois 312/986-6000. CW 11/14

PANSOPHIC®

EDITORIAL

New Kids on the Block

The emergence of a new decision support system department in a number of large corporations has meant a new title for the person managing the department. It has also added one more element to the corporate political structure with which today's management information systems director must cope — whether he wants to or not.

Formal DSS departments did not suddenly spring full-blown because overambitious administrators wanted to increase their visibility by adding more reporting lines on corporate organization charts. But the fact is that the decision support function is a highly visible one, and the MIS executive who only reluctantly agrees to cooperate with the newly powerful manager of decision support applications may find himself in an untenable position.

Areas falling within the DSS manager's purview tend to incorporate end-user-oriented entities such as the information center, office systems, financial modeling and manpower planning. These functions, and the people working with them, have needs that have apparently not been successfully addressed by the traditional MIS department. Yet, decision support managers recently interviewed by *Computerworld* maintained that the very act of filling these needs generates some antagonism from MIS employees [CW, Nov. 7].

It is, perhaps, natural to feel some resentment for co-workers who have the advantage of interacting with top management without having had to pay dues in the less glamorous and less visible systems department. However, the wise MIS executive will realize that the new kids on the block in the DSS department can make his job much easier by taking away the increasing pressure from end users who want their information problems solved now and simply don't want to hear about things like a two-year applications backlog.

Offloading functions, like financial modeling, that depend on immediate turnaround to the DSS area can free MIS personnel to cut that backlog down and respond to complex and sophisticated user requests that require the expertise of the professional information systems specialist. And the DSS department can offer another choice of career path for programmers and analysts who wish to develop business expertise to complement their technical knowledge.

Thus, cooperation between MIS and DSS managers can work to everyone's advantage. The end user gets his solutions more quickly, the MIS executive can utilize his resources more effectively, and the technical specialist has the opportunity to round out his professional background. An obstructionist attitude toward DSS from the person at the top of the information systems organization can only work to his disadvantage and, with increasingly computer-literate top management, eventually lead to political disaster in the corporate arena.

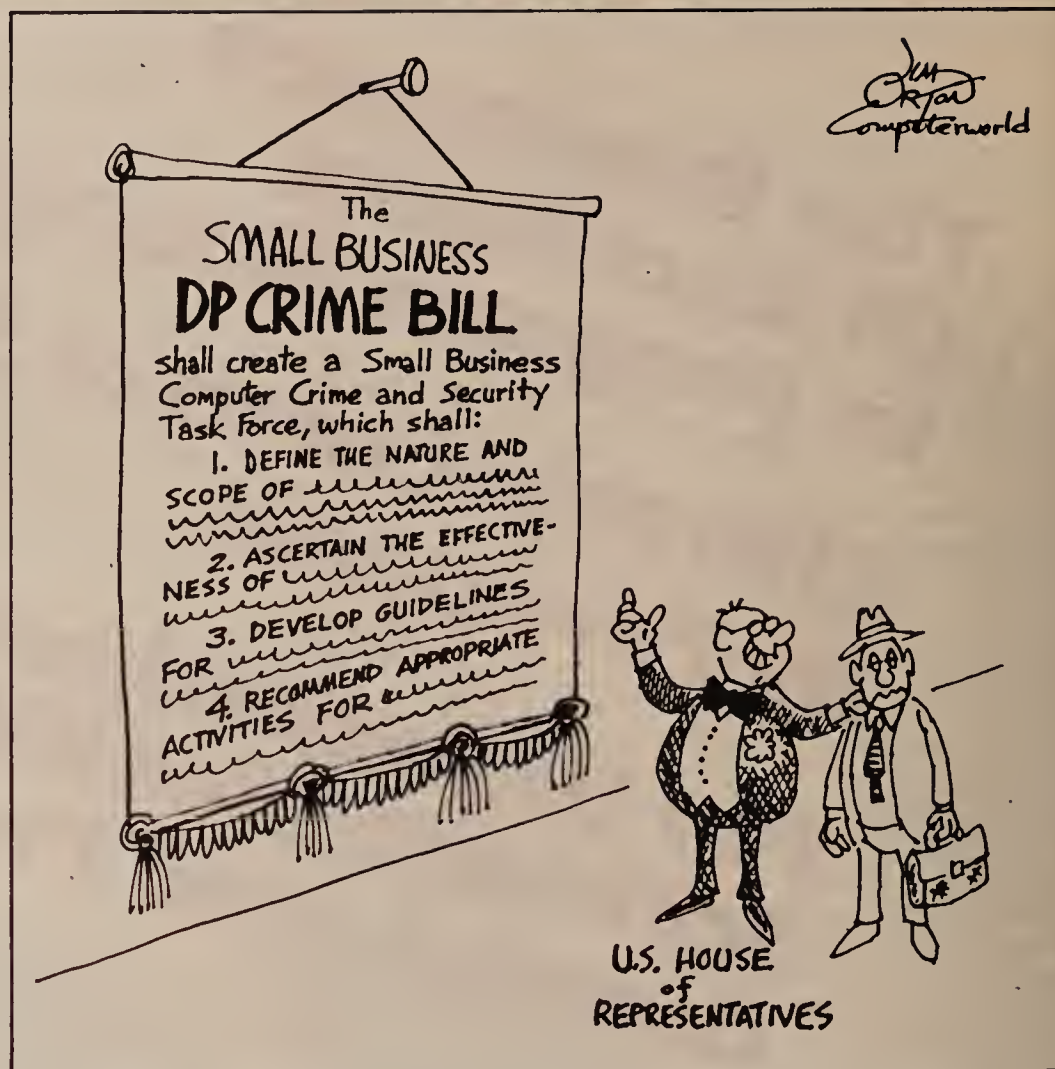
DATA PAST

Five Years Ago Nov. 13, 1978

LOS ANGELES — The Federal Bureau of Investigation arrested a computer consultant, Stanley Mark Rifkin, on charges of using Fedwire, the Federal Reserve's electronic funds transfer system, to steal \$10.2 million from the Security Pacific Bank here. The heist was considered to be one of the largest thefts in U.S. banking history.

Ten Years Ago Nov. 14, 1973

LOS ANGELES — A computerized car-pool system established here successfully matched 1,700 persons in the first week of operation. But the system was also criticized for creating a confidentiality problem for police officers, whose home addresses were listed on the computer print-outs and then posted in some city buildings.



'Why Hit the Computer Criminal With Legal Penalties When We Can Drown Him in a Sea of Paper?'

LETTERS

Major Mistake

Deregulating the channel service unit (CSU) in Dataphone Digital Service (DDS) circuits is a major mistake, in the words of a DDS user.

DDS has been a premium service, which offers high reliability to its limited number of electronic components.

Responses to problems on a DDS were quick, due to a single party being involved and the party's ability to test all components on that system.

With the CSU installed at either end, AT&T is able to ensure that the line is operational end to end. Without the AT&T CSU in place, it is impossible to differentiate between line problems and customer premise equipment problems through a central site test.

The portion of the network whose integrity is in question, if the deregulation of the CSU goes through, is the portion of the communications line that goes from the DDS hub to the user site.

Should a failure occur in this stretch of communications line or equipment, the procedure for testing and identifying the problem should continue to be to loop back the client site by means of the CSU.

The primary function of the CSU should continue to be a testing device, in addition to being a termination device.

Deregulation of the CSU probably means that AT&T no longer can control-site test the local loop.

But even if a non-AT&T CSU were to be used for testing and a failure condition were to be detected, I'm afraid that a line service call would not be placed.

Rather, the client would be asked to have the CSU checked by the ser-

vicing company. This would probably require a minimum of six hours to 24 hours to have a third party or vendor dispatched for the purpose of checking the CSU.

Once the CSU was found to be functioning properly by a field engineer or technician at the site, then AT&T would be contacted and asked to dispatch someone to identify or repair the problem on the line, thereby creating an additional delay in repairing the DDS network.

The deregulation of this device ensures the degradation of service in the way of mean time to repair, isolate and locate problems and dispatch service. Quick repair and high uptime have made DDS a premium service.

The parties that have lobbied for this deregulation do not have the best interests of the user in mind, but are more interested in the revenue of CSU sales to the consumer.

As a user, I would gladly pay the few extra dollars that would be saved to maintain this section of the DDS line under the umbrella and responsibility of AT&T.

I strongly urge that this deregulation be defeated so that the CSU can be maintained and used as a termination and testing facility for the DDS service.

Howard Fingerhut
Network Manager

Shaw Data Services, Inc.
Wayne, N.J.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

LECHT ON SCIENCE/Charles P. Lecht

PCjr's First Halloween

In the somber streets of a quaking computer community, Halloween was dolefully celebrated this year by a heartrending lot of ghoulies and ghosties. Still connected to the living by their own memories of life, a spectral pack of microcomputer companies past rattled their chips and chains upon the doorsteps of their colleagues not yet dead, showing the gaping mouths of their empty trick-or-treat bags with uncomprehending misery to all who would look. What a wailing was there!

Mattel, Inc. moaned, Atari Corp. shrieked and tore its hair, Osborne Computer Corp. squinted blindly through its tiny screen while Computer Devices, Inc. scrolled the black-bordered pages of a book composed solely of Chapter 11s. Texas Instruments, Inc., in the lead, pointed the way along DP's Via Dolorosa with the index finger of its severed microcomputer arm.

Behind doors barred to that cold night, the remaining manufacturers stood rooted in indecision, not knowing whether to stop up their ears or heed the baleful complaints of their deceased brethren in hopes of learning how best not to join them prematurely. Taking its feeble pulse, Coleco Industries, Inc. wondered whether it would be here at all if God had taken as long to create Adam as it had. Digital Equipment Corp. had nightmare visions of a rainbow limned in lugubrious shades of gray. Wang Laboratories, Inc. was driven nearly to distraction by the cries of the watchamacallit it kept bricked up in its dark cellar. Tremulous Tandy Corp. adopted a pose of irritation, silently praying

'In the midst of the restless spirit horde lurked the weirdest and most thoroughly terrifying creature of them all: a big, blue meat-eating peanut. It stood out among the ghosts of what had been and what might have been by virtue of its yet-to-be quality. And what could be more frightening then that, for this was the wraith by which both the quick and the dead were haunted.'

that affected scorn could banish doubt from the troubled minds of its management. Apple Computer, Inc. secreted razor blades in the Macintoshes it had specially prepared to induce terminal indigestion in its competition and then, as the first, ghostly footfall was heard on its stair, disconsolately ate a few itself.

Abroad, the Japanese, long accustomed to spirits and especially familiar with the inscrutable American version of the spirit of competition, prepared to find themselves in the shadow of a new trade barrier or two; they realized that, whatever sweets they might dispense to these foreign devils, they'd be in for a trick or two just the same. The French wondered whether ghosts could be kept at bay with goose liver. The Germans, misreading the situation, invoked inappropriate spells for the warding off of vampires. An uneasy peace prevailed among the English and the commonwealth, as they prayed through the night in Anglican innocence.

Meat-Eating Peanut

In the midst of the restless spirit horde lurked the weirdest and most thoroughly terrifying creature of

them all: a big, blue meat-eating peanut. It stood out among the ghosts of what had been and what might have been by virtue of its yet-to-be quality. And what could be more frightening then that, for this was the wraith by which both the quick and the dead were haunted.

As to its cry, above the bloodless boos of the others, it emitted the sustained and sanguinary howl of a thing that must be fed. This was such a sound as to freeze the blood of the entire global microcomputer community. This was the fearful herald of something whose prototype would materialize only a few hours later, on All Souls Day: the Peanut that would swallow the world, that had already swallowed a fair chunk of it at the moment of its concept — in fact, the unpunctuated IBM PCjr.

Yet in the light of dawn, these graveyard apparitions vanished, as they always do, and there was little but smiles to be seen at the All Soul's Day christening of PCjr. The bells of the Great Cathedral of Mammon reverberated with the news. At the baptismal font, Wall Street analysts, consultants, members of the press, official and avocational soothsayers and dignitaries in pin-striped morn-

ing coats oohed and ahed over PCjr's gummy fingers and large, tooth-filled jack-o'-lantern mouth. Officiating bluecoated clerics gave absolution to the doubters in the crowd, who thereupon professed themselves reborn in the hard, cerulean light pouring through the windows.

Other micro makers prayed fervently ("O Lord, ASAP!") for a similarly blessed junior of their own. A chorus of software monks raised its voice in thanks ("Unto us a standard is giv'n, the wherewithal to make a liv'n, the Big Blue Standard is the Big Gold Standard to us!") and dreamt of illuminating the characters of its program manuscripts in those two jubilant shades.

Then came the moment of truth for all assembled, well-wishers and otherwise. The sternest judges stepped forward to administer PCjr's final, public test of legitimacy. A PCsr floppy wafer was placed on the newborn's tongue; at once, PCjr's caterwauling gave way to the flawless performance that only the child of so illustrious a parent could carry off. Hosanna! This was truly the progeny of the formidable PCsr. Financial analysts prepared early Christmas cards for mailing to investors, manufacturers and consumers everywhere, showing smiling children disgorging PCjrs from their blue Christmas stockings.

And then PCjr vanished. In the still-warm swaddling clothes and packing materials, there remained nothing but a junior-size note, which read: "Happy Halloween! Buy long! See ya next year." (A documentalist's (Continued on Page 83)

READER COMMENTARY/John Dillavou†

Programmers Can Write Good Documentation

Many data processing professionals erroneously assume that programmers are unable to write concise, intelligible and grammatically correct documentation. These same professionals also accept as fact the premise that documentation analysts are inherently poor programmers. Although there are abundant examples supporting both arguments, I have found many inconsistencies in this reasoning.

My thinking on this subject was reinforced recently when I reread *Elements of Style* by Strunk and White (third edition; New York: Macmillan Publishing Co., 1979). This book lists rules and principles to follow for effective written communication. Many of these rules are equally applicable to computer programs.

While reading this book, I asked myself the following questions: If programmers can learn to write clear, concise and structured code, why shouldn't they be equally adept at writing clear, concise and intelligible documentation? And conversely, shouldn't good writers make good programmers?

Before answering these questions,

it would be instructive to compare good writing and good programming.

Good writing and good programming have four common characteristics:

- **Organization.** A programmer who writes hodgepodge code is like a writer who rambles. In recent years, much emphasis has been placed on the use of structure charts and other devices for organizing a program. The structure chart is really no different from the outline used by writers. Both devices are techniques used to structure hierarchically one's thoughts before beginning the process at hand.

- **Conciseness.** Good writing demands a parsimony of words. Readers tire quickly of writers who are verbose or who use ornate or unneeded language. Unfortunately, programming verbosity is often overlooked. How often have you seen programs in which a simple "PERFORM VARYING" could have replaced six or seven lines of Cobol code?

- **Clarity.** The saying "Programs are written to be read" has become a cliché. Yet it wasn't until the mid-

1970s that the technological advances in hardware finally enabled management to favor comprehensible code when they were faced with a trade-off between efficiency and understandability.

Although the writer of technical documentation does not face a similar type of dilemma, he is often faced with a decision of sacrificing readability because of time constraints or budget pressures.

- **Egoless Style.** The reader of a computer program or a technical document is not concerned with the writer's state of mind. Instead, his attention is focused on understanding a particular function or process.

As with writing, there are no hard-and-fast rules governing one's style of programming. Programming styles often vary. Yet in all cases, a style that promotes clarity is preferred.

Management's Role

Can programmers write quality documentation? Of course they can. It is a disservice to the career development of DP professionals to assume that their written communica-

tion skills are beyond redemption. Just as important, management is wasting hard-fought budgetary dollars if they hire technical documentation specialists for jobs that can be adequately performed by programmers.

Conversely, management should consider for a career in DP individuals who have displayed a flair for writing. Although they may lack the prerequisite technical skills, it has been my experience that they eventually become every bit as productive as career programmers.

Why are there so many examples of poor writing if good programmers are by nature good writers? I believe this phenomenon is due to a lack of foresight on the part of management. When management regards technical and user documentation as integral parts of the deliverable product, the quality of documentation will rise. If, on the other hand, documentation is treated as just another "box to check," the status quo can be expected to continue.

Dillavou is a manager within the management advisory services practice of a national accounting firm in Los Angeles.

READER COMMENTARY

How Microcomputers Can Aid in Applications

To get the most out of each personnel dollar and hour, today's management information systems (MIS) director wants to improve applications reliability and achieve cost-effective development. Since the costs associated with maintaining a staff have become the largest element in most MIS budgets, any tool that can help to achieve these twin goals should be sought out and thoroughly evaluated. Some firms, through creative and sometimes aggressive utilization of microcomputers, have taken steps toward achieving these much sought-after goals of improved productivity and cost-effective de-

velopment.

A management consulting firm, for example, utilized microcomputers to develop software for its clients in the distribution and retailing industry even though the applications it was developing were intended for mainframe computers.

The consulting firm chose to use a micro for a number of reasons:

- Since it did not have any DP production requirements, it did not need a large CPU to process the large numbers of transactions typically associated with a production environment.

- Its applications software was

written in Ansi Cobol, which made it highly transportable and adaptable to a large number of mainframes from different vendors.

- Using a multiuser station micro, it was able to increase throughput while enhancing the productivity from its four-member programming staff.

- Its micro had both an 8-in. diskette and a Winchester disk. The Winchester disk allowed the firm to handle sizable volumes for a meaningful test of their applications, while the 8-in. diskette allowed the transportation of data and programs to and from clients. Further, when a

client did not have diskette capability, information on the diskettes could be transferred easily to 800 or 1,600 bit/in. tapes. This flexibility broadened the base of mainframe vendors' installations they were capable of supporting.

Thus, the consulting firm chose micros as a cost-effective (\$18,000 to \$25,000 less expensive when compared with comparable mini/mainframe hardware) alternative in an environment that was primarily devoted to developing application software. The application products it developed could be run, tested and prepared for installation in any client's environment.

With the micro, the firm could achieve higher productivity (estimated at a 12% improvement) with minimal technological complexity for its staff and, because of the controlled environment, develop highly reliable software while supporting client installations efficiently and cost-effectively.

Second Example

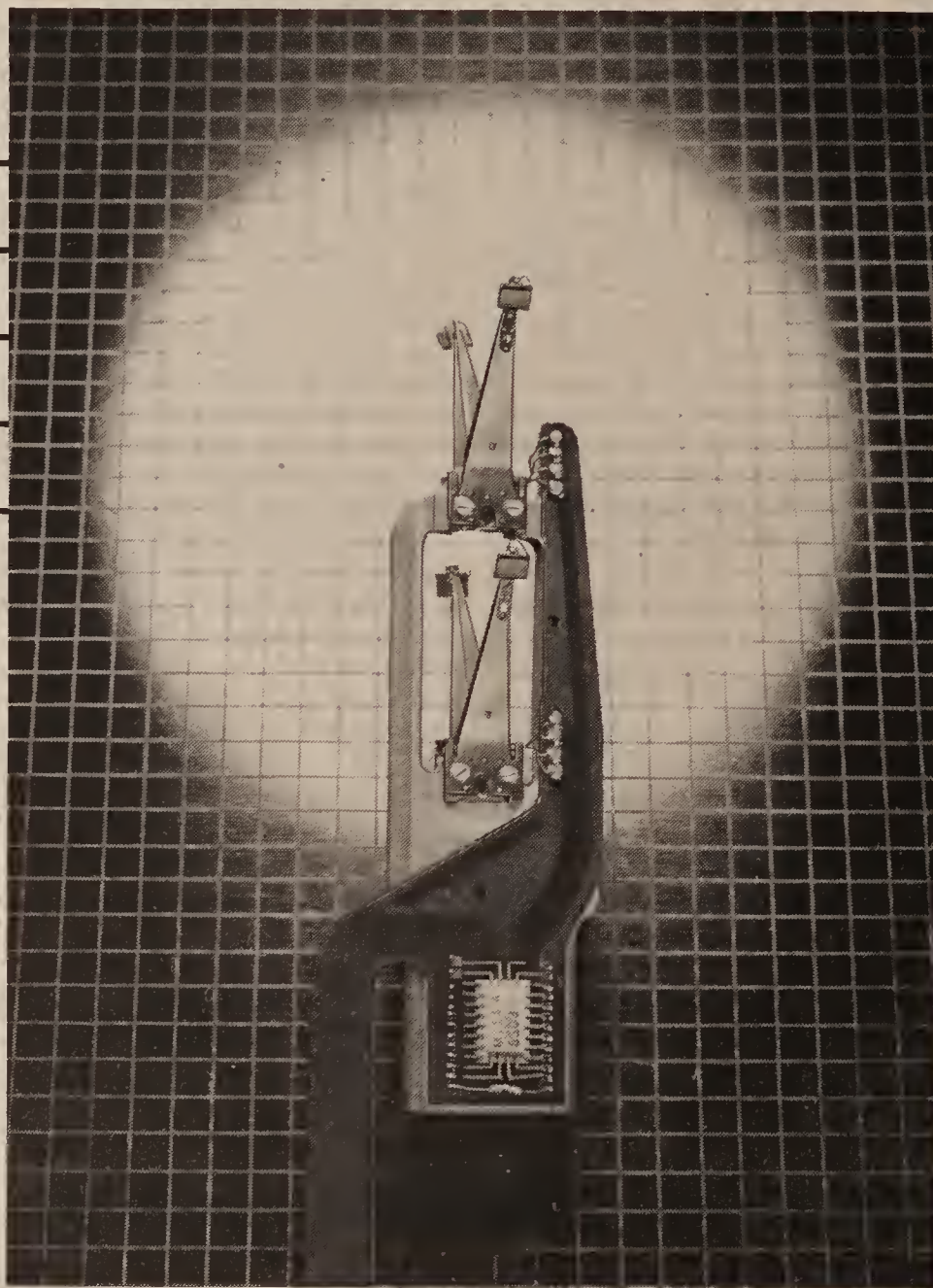
As a second example, the MIS department of a large food retailer utilized micros to test and train new programmers. It also used program-generator software on the micro to develop data entry systems with user-oriented capabilities for heavy editing. These systems enabled the company to provide quick responses for important projects and to fulfill requirements on an interim basis until its traditional IBM CICS-based user data entry systems could be established. As an aside, all requirements for 3741s (key to diskette data entry machines) were eliminated.

The retailer conducted an extensive evaluation before deciding to give micros a role within the organization as an adjunct to, and in some cases a replacement for, its main DP resource. Ironically, the DP function, which initially had resisted the introduction of micros, evolved into its strongest supporter and user. Initially, it found a use for micros in the training and qualification of new programmers.

Because of their simple operation, micros proved extremely successful in overcoming the problems posed by the disparate backgrounds of new employees trained on different hardware. Since the programming skills (especially Cobol) of new employees could be confirmed rather quickly, the emphasis during training could then be on Job Control Language and other procedures for the specific hardware and software environment. This company believes that besides reducing staff training expenses by approximately \$12,000 per year, better screening and training has brought about an intangible savings because of reduced turnover.

However, the true value of the micros became evident as a result of the pressures resulting from staff turnover and the need to respond quickly to important and high-return projects. Because of substantial staff turnover, the MIS department had found it increasingly difficult to fulfill user requirements responsively through

WE PUT OUR THIN-FILM
HEADS TOGETHER AND
CAME UP WITH A BETTER
STORAGE SYSTEM.



PCM COMMITMENT YOU CAN
COUNT ON FOR GENERATIONS

Actual size

We took innovative technologies and built the most advanced DASD systems now on the market—the Control Data 33800 and 33750. Like our thin-film heads—shown above in a head/arm assembly. Like four separate and independent, sealed Head/Disk Assemblies (HDAs): sealed for protection from computer room air; independent for improved maintainability. Dual access and dynamic path selection mean greater

throughput and better string availability. Like all our DASD systems, the 33800 and 33750 are fully compatible with IBM architecture. And they offer additional benefits like XA compatibility and floor space savings of up to 20%. The 33750 is even field upgradable to a 33800.

With the 33800 and the 33750, our PCM commitment pays off again. For more information, call 612/553-4311.

CD CONTROL DATA

James M. Tharrington†

Reliability, Development: Three Examples

the combination of data base and CICS in a mainframe environment.

Out of desperation, one of the systems supervisors, who acted as the microcomputer coordinator during the evaluation project, struck upon the idea of utilizing the micros and a program generator to develop data entry programs that could be implemented more rapidly than those normally developed. Much to his surprise, initial efforts proved so successful that this "interim" measure allowed a return to the 3741s, and users entered data on micros for their own tasks.

Shifting the responsibility by putting user-oriented data entry systems with heavy editing capabilities in the end-user environment produced greater responsiveness and, therefore, increased accuracy in the data entry function. The transmission of the edited information to the mainframe was initially performed via simple diskette reformatting and transfer via diskette reader, but ultimately was done through communications.

Thus, through innovative — and somewhat fortuitous — use of micros, the firm was able to improve its users' responsiveness while increasing the cost-effectiveness of its operation (it estimated that over a three-year period, it saved \$75,000 above its investment in the micros by displacing the 3741s).

Final Example

A company that develops applications software provides a final example of the practical approach toward the use of micros. This company understood the creative nature of its business and its employees and recognized that the process of writing software need not be constrained by time or location. Therefore, it provided each employee with a microcomputer for use at home. The firm believed its home micros would result in increased productivity.

First, since the micros were provided with a communications interface, the employees had access to the firm's mainframe from their homes. Thus, they could be engaged in the creative process at any time.

Second, not only would the employees have access to the program code that they had already created, but they would be able to test these programs. Even without the communications interface, they would be able to create new programs or program

segments and compile these programs or segments, check for program grammar errors or even perform limited tests based upon the files available for testing.

Although the firm never attempted to quantify dollar improvements resulting from the micro availability, it did note improved flexibility

in staff utilization and better deadline management.

In each of these three scenarios, the approach to using micros was either innovative or nontraditional. These two concepts warrant emphasis because in the dynamics of the DP environment, the willingness to seek nontraditional answers to traditional

problems may not be just an innovative approach — it may be the only practical approach.

With the tremendous growth in the use of micros and the never-ending stream of new and better products on the markets, it is less effective than ever to approach a DP problem wearing blind-

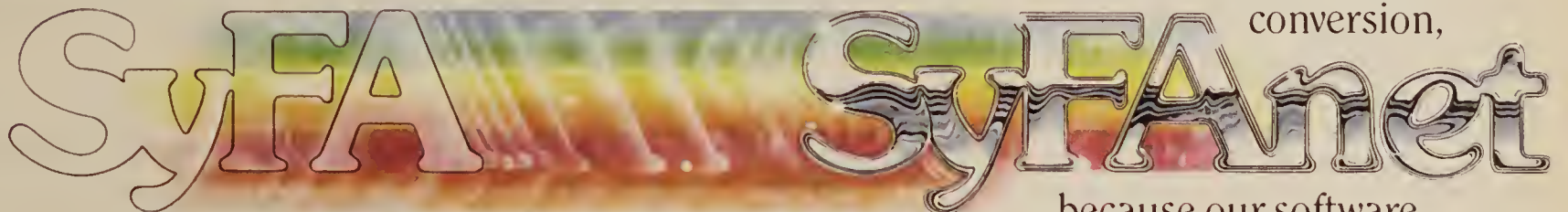
ers. Today's MIS management must learn to look laterally at problems and seek solutions outside the framework of the traditional — because in many cases, traditional solutions will no longer work.

Tharrington is a senior partner at Case and Co., Inc. in Stamford, Conn.

NETWORKING VS. NOTWORKING:

ANNOUNCING THE NET RESULTS.

Linking micros to mainframes is one of the most pressing problems facing DP managers today. How do you bring all the computers in your company together so they can share information, resources, programs, and access the corporate data base without any loss of security?



Networking is a nice concept but it won't work unless you have a system that works.

SyFAnet™ (System For Access network) is the network that works. The only complete solution on the market, ready to meet all your networking needs now.

SyFAnet gives you everything you ever wanted in a network: the ability to link PCs together, multi-function workstations, industry-standard software, global information access and unlimited expansion capabilities. All fully-integrated, and built upon a foundation of proven hardware and software.

Picture a powerful processor for every purpose—one for applications, another for sharing resources. This special architecture makes SyFAnet a more reliable network, with no single point of failure. Every time you add a terminal,

you gain more power instead of losing it.

Our broadband bus offers more flexibility. So you can add more users whenever and wherever you want.

By adding microprocessor-based workstations and CP/M-86, SyFAnet gives you more functionality, too. You can upgrade easily without costly

conversion,

because our software remains the same at all levels.

And while *you* might get confused by the flurry of message traffic in the office, SyFAnet never does. Its unique version of collision avoidance means data doesn't get lost in the shuffle.

Because business doesn't stop at borders anymore, SyFAnet was designed with the whole world in mind. SNA and X.25 capabilities connect you to mainframes and networks around the world.

SyFAnet. Ready to solve your networking problems today and tomorrow. It's the network that works.

For more information, write or call today.

 **ComputerAutomation**
Commercial Systems Division

1800 Jay Ell Drive/Richardson, TX 75081
(214) 783-0993/TLX: 4630023

READER COMMENTARY

The Ever-Changing World of DP Auditing:

Data processing auditing, as we know it today, is dying. The profession is going to evolve and grow, just as companies do. It cannot be held static. We must look at how it is changing, where it is changing, why it is changing and accept the fact that all institutions grow, develop, begin to wither and, finally, contribute to something new and different.

How has DP auditing changed over the years since it has been accepted as a separate area? It certainly has gotten more recognition and has moved up within the corporate hierarchy.

The DP auditor today is very likely to be a fairly senior individual in his company. But consider the individual who has risen to the top in DP auditing.

Median Age

It is a safe assumption that the median age of DP auditors does not exceed 40. The 40-year-old DP auditor today is going to retire in the year 2008. Will he be doing what he is doing now for the next 25 years? If the answer is "no," then the skills, talents and access to information that DP auditing has provided him should serve as the basis for the rest of his career. The professional career of the 40-year-old DP auditor is not yet at the halfway point. He has a long way to go and is still setting the foundation for something else. The future, whatever it will be, will be different. The DP auditor had better be prepared to adapt his skills, technology and talent to new fields.

He will need credentials to establish his position as a corporate manager in the future. Today, the DP Auditors Foundation has established the Certified Information Systems Auditor (Cisa) program. The Cisa designation is a mark of professionalism, and the Cisa examination is proof of the fact that DP auditors are learned, well read, experienced and determined to do business in an ethical fashion. That sense of professionalism has served not only to build a base under the DP auditing profession, but to be a launchpad for greater remuneration.

The salary base for DP auditors is outstripping inflation. This indicates that the basic market value of the skills that DP auditors have is growing in real dollars. There is a sense that anyone with a B.A. in accounting can get a job in auditing. The disparity in salaries is creating internal divisiveness within many auditing departments. The fact that financial auditors and DP auditors have to be paid on different scales under the same management indicates that DP auditing is experiencing its own independent pattern of development and growth.

That growth is reflected in the number of people who consider themselves to be DP auditors. For all those at the bottom and at the middle levels of DP auditing, there are questions: Where do they go from there? How high up the ladder can they climb?

The 40-year-old DP auditor has seen many changes in the field, and

yet he has seen a lot of things stay the same. He has been out of college for 18 years. Perhaps he got his first job as an auditor and was sent to a DP course. A year later he found himself to be the first DP auditor in his company. For all his professional advancement, he is still the DP auditor — he just has more people working for him, auditing and controlling computer systems.

Where does he go now? And what of the people behind him — those people who came into the profession 10 years ago and who have experienced a steady pattern of career advancement? Today the manager of

DP auditing is standing in the way of not only the two people behind him, but of the four behind those two and eight behind those four and so on. How much growth can the field absorb? We are seeing maturity; the function of DP auditing cannot rise much higher than it has today in the auditing profession as currently understood.

A by-product of maturity has been the integration of DP auditing with financial auditing. There are many functions that the financial auditor was held back from doing, but is now being given a chance to do. The salary differential is, however, still

there. Take a financial auditor, teach him how to program a retrieval package, teach the auditor how to recognize systems controls and teach him how to review the development of a system to see if it is being done properly.

What has he become? A DP auditor.

He can move on and get a job as a DP auditor in a company in which the functions haven't been integrated yet. With more people coming into DP auditing pressing entry salaries from below, and the top position in DP auditing reaching maturity at the other end, where are salaries to

BEFORE YOU INVEST IN PA CHECK THE INSCI

MSA

**Dedicated exclusively
to computer-based
payroll/personnel management.**

**Fully integrated, native database
systems and true on-line,
real-time interactive VSAM.**

**Most experienced.
Started the industry
in 1965.**

**Delivered over \$100
million in computerized
Payroll/Personnel Systems.**

**The choice of two
powerful options:
Software and Service.**

Note: InSci systems operate in IBM 370, 43XX, 30XX and compatible environments, and are TP monitor independent.

Steven J. Ross†

How to Adjust to It, Prepare for the Future

go in the future?

I fear and foresee a leveling of the DP auditor's salary progression. Remuneration will not continue to exceed inflation. Already, the best and the brightest (and the youngest) in DP auditing are moving up and moving out into other control-oriented functions, such as data security or data base administration. If the boundaries traditionally drawn around DP auditing are accepted as the only definition there is, then the best and the brightest may be outside that boundary. On the other hand, rather than exclude the ones that have gone on in their careers, it is better to extend the boundary.

The DP auditor must sacrifice a certain degree of audit independence in order to be part of the process of control. Already, many DP auditors help to design controls, auditability and security in information systems. When the auditor signs off on each stage of development, the loss of some of that independence accomplishes effectiveness. It is cheaper to put the controls into the system in the beginning than later.

Skills Need Recognition

It is time to start recognizing valuable skills, skills that the community needs, the company needs, the application needs and that have to be integrated into the development and operational processes. Whether those skills are called auditing, control or management is less important than the fact that the systems are audit-able and controlled and managed.

There is not much about the future that is definitive, but one thing is definite about the past: It is over. To quote the immortal Satchel Paige, "Don't look back, something may be gaining on you."

Something is gaining on DP auditing — kids who are learning programming in grade school. It is the

financial auditor who is integrating DP auditing into the overall audit program. It is the data processor who does not want the auditor to tell him how to control a system and is developing a control specialty in DP. Each DP auditor should be prepared for change, because the future he predicts is not necessarily the one that is going to come. There are so many variables in this integrated world that no one can know exactly what is going to happen. It is so different today than we thought it would be. Be prepared for at least as much change in the future.

Ross is a principal of The Plagman Group, Inc. in New York.

ROLL/PERSONNEL SYSTEMS, DIFFERENCE

INSCI

Maybe it's not fair to compare anyone else to InSci. After all, we do have some unfair advantages: InSci invented the computerized payroll/personnel industry in 1965. So we have a head start.

All of our people—every one of them—is dedicated solely to putting the computer to work to help Payroll/Personnel professionals do their jobs more effectively and cost-efficiently. We have no other business, unlike our worthy competitor, the generalist. Our expertise has enabled us to provide the industry's only true native database systems. The competition offers resource-robbing interface systems. The fact is, we're the world's largest specialist in automated payroll/personnel systems. Our systems and services have benefited 50 Fortune 100 corporations, 45 of the 125 largest banks in the U.S., and nearly 1000 companies worldwide.

Before you invest in a payroll/personnel system, it will pay to check the InSci Difference—the leadership difference. Start by sending us this coupon. Or just call Christine Hanavan at (201) 391-1600.

First Halloween For IBM's PCjr

(Continued from Page 79)

official footnote pointed out that next year was only two months away.)

Sigh of Relief

The imagined Christmas stockings collapsed, now stuffed with nothing more substantial than a gift certificate redeemable in 1984. Certain micro manufacturers released a deeply ambivalent sigh of relief; a stay of execution is not quite the same thing as a reprieve, after all. And would anyone remember their names between this day and the new year? The Big Event was over — for the moment.

Meanwhile, back in Basking Ridge, Judge Green's incredible Shrinking Giant yawned and sank into untroubled sleep. Metamorphosing easily from one to 23 entities and back again with the rhythm of each nocturnal breath, it dreamt a dream of PCs, junior to senior, madly proliferating like the buckets and mops of the sorcerer's apprentice and all of them seeking to connect and talk to each other and to yet bigger systems on the giant's tolled networks.

As it dreamed on, a vision of the ultimate Halloween joke formed in its brain: The progeny of PCjr would be as minuscule and featureless as the single plug needed to connect consumers with the giant's own massively integrated systems digital networks, and the Big Blue Terror would distribute itself to death. Twenty-three sets of lips parted to form a smile shaped by years of experience at gobbling down such small fry as this.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.



Christine Hanavan
Information Science Incorporated
95 Chestnut Ridge Road,
Montvale, New Jersey 07645
YES, I want to know more about the InSci Difference
in payroll/personnel systems. Send me more information.

Name _____
Title _____ Phone _____
Company _____
Address _____
City _____ State _____ Zip _____

C1114

InSci

READER COMMENTARY/Ted Singer†

DP Hackers Not Our Greatest Threat

In August, we were somewhat stunned by the Federal Bureau of Investigation apprehending a group of computer hackers. We heard that the data processing vandalism perpetrated by youthful members of the group reached into the depths of computer systems across the expanse of our nation. Wiping out student records, penetrating medical records of cancer victims, entering one of the systems at an atomic research installation is all somewhat terrifying to those of us who depend upon the integrity of data within our systems. Suddenly, computer security became a topic of national interest. Every

type of new media milked the story for everything it had. We are still being assaulted with articles, letters to the editor, accounts of hearings and possible prosecution involving the vandals.

It would seem that the serious threat we have from these "electronic vandals" (a term coined by Donn Parker, a DP crime expert) is the greatest threat we have to face in protecting our systems and the information they contain. Not so. Electronic snooping and manipulation has been a real threat for years, and it will continue to be a threat in years to come.

We have more serious threats from within and without. If we concentrate on denying access by hackers, we are only fooling ourselves. With sums in the hundreds of billions of dollars floating around from system to system every day, we are primary targets of professional thieves. Measures that prevent hackers from entering our systems, no matter how successful, will not necessarily keep professional criminals out. Organized crime must certainly have some of the best technical experts on its staff. With millions and millions of dollars at stake, perhaps even more, the professional criminal

can pump sufficient funds into technical research involving our security systems to cause crime to become such a threat that hacking becomes almost insignificant.

Worst of all, professional DP crime can be covered up in such a way that our auditors may not be able to detect it. We may find that our receipts and profits are much less than we expected; however, even with thorough investigation, we may not be able to find out why. Security systems dedicated to keep professional criminals out of our systems should certainly prevent vandalism by youthful hackers.

Penetration or message interception and manipulation by outside forces may not be our greatest threat either. It is our own people, our officers, managers and employees (even consultants) who are best equipped to commit computer-related crimes within our organizations. They are, first of all, most trusted by the rest of us. They have direct knowledge of our systems and how they operate. Many of these people are authorized users and have the capability to enter a system and create sufficient activity within the system to commit crimes. Even if duties and access limitations are segregated to the extent that a conspiracy involving several employees would be necessary to commit a crime, they have or can easily develop the close relationships necessary for such a venture.

Personnel Relations

Crime by our own personnel is the most difficult to safeguard against. Mistrust has never been the basis for good employee relations that are so necessary to efficiency and productivity. Except for the partitioning of duties, personnel screening and monitoring are our main weapons. Good morale, pay and benefits and all the things that go with personnel relations can be a great assistance. However, all these things are delicate matters and must be achieved through diplomacy.

Realistic audit trails reporting all activity within the DP system are a must. To be effective, the audit trails should be examined by individuals other than the ones who would be in the best position to commit fraud. Actions taken to prevent and detect crime from within can also lead to minimizing negligence and abuse, which are probably the greatest threats of all to our DP operations.

It seems that the stress today is upon DP-oriented crime and vandalism; therefore, the other things are somehow put on the back burner while we attend to matters that are highlighted in the news. With the utter dependency we have on our DP operations for production, our jobs and the solvency of our corporations, we should never place anything pertaining to the protection of our computer system, its data and its uninterrupted operation on the back burner. Computer security, whether we like it or not, is essential to our very existence in the DP field.

Singer is a computer security consultant in San Antonio, Texas.

The Data Center is under your command.

But is it under your control?

Value Computing's systems management software automates the critical tasks of production forecasting and scheduling, capacity planning, and resource allocation and accounting, and brings those tasks under centralized control. Your control.

The effects on data center operations are immediate: a more stable production environment ... faster turnaround ... fewer manual procedures ... shorter night processing times ... fewer mistakes, misunderstandings, re-runs ... less management dependency on operations personnel.

In short, a smoother running, better performing data center; a center where managers get the most intensive use of all resources. Without making a

major capital investment in additional CPUs or peripherals.

We don't believe there's a more cost-effective way to improve the performance of your data center or the value of its position in your company. Call us and find out why more than 1500 users agree.

Value Computing Software Systems:
DCMS—The most powerful and comprehensive production scheduling and control system available.

Comput-A-Charge—The industry standard in job accounting and computer billing.

VALU-LIB—An entirely new tape management system designed for today's VS environments.

SMF Express—A unique package for the management of important SMF data.

VALUE COMPUTING

THE OPTIMUM SOFTWARE FOR DATA CENTER MANAGEMENT

Value Computing, Inc., 498 N. Kings Highway, Cherry Hill, NJ 08034 (800) 257-8242. In New Jersey (609) 482-2500



To Avoid Problems Later

Consider Performance in Choosing DBMS

By Peter Breeze
Special to CW†

Too often companies overlook data base management system (DBMS) performance when choosing a DBMS. What they discover is that in the early implementation

IBM Spreadsheet Targets End Users On MVS, VM

WHITE PLAINS, N.Y. — IBM has announced a mainframe spreadsheet for its MVS/TSO and VM/CMS operating environments. Oxycalc reportedly allows end users to create, manipulate and save spreadsheets. The report required is entered directly on the display screen in the format desired, a spokesman said.

Features include an on-line tutorial, a Help-programmed function key with Help panels to explain errors, extensive use of menus, full screen editing and the use of tab and program function keys to select spreadsheet areas.

The program is invoked by a single keyword on an IBM 3270 terminal, the spokesman said. The user can then select a tutorial on the use of Oxycalc; review program function key assignments; change any spreadsheet, chart or report file definition; operate utility functions such as selecting spreadsheet display colors, browsing or printing a previously created report file; or begin viewing a previously saved spreadsheet.

Spreadsheets can be as large as 132 columns by 32,000 rows. A set of arithmetic and logical operators and a set of mathematical, econometric, trigonometric and logical functions are provided to define value relationships.

Oxycalc was designed to utilize fully the color highlighting and graphics features of the IBM 3279 color display and 3287 color printer, the spokesman said.

The product is available for a one-time charge of \$8,000 from IBM's National Accounts Division at 1133 Westchester Ave., White Plains, N.Y. 10604.

stages, when the data base is relatively small and there are few applications, performance is acceptable. But as the size and complexity of the data base increase and an on-line environment is added, DBMS performance is taxed.

The common solutions are to upgrade the hardware, which is expensive and not always successful; convert to a new DBMS, which is costly and time consuming; or abandon the idea of an integrated information system. If companies consider performance when selecting a DBMS, many problems can be avoided.

Two factors are important to understand:

- The on-line environment is infinitely more complex and consumes more resources than batch.

- An on-line system accessing a data base environment adds an even higher level of complexity.

The performance "trap" is subtle at first but worsens exponentially as data base/data communications (DB/DC) implementation progresses. Two key performance

'Since there are no great breakthroughs in direct-access device speed expected during the 1980s, execute channel program measurements are perhaps the most important of all [data base management system] considerations.'

factors are priority job scheduling and inefficiency of direct-access devices.

Most computers use a priority job scheduling system to accommodate multiple users and processes. Typically, the operating system has the highest

priority, followed by the on-line system, the DBMS and various application processes. It is important to study the stages of competition for CPU cycles when the processing load is increased.

During stage one, only a few applications are processed on-line. The data base is neither complex nor large. The high-priority data communications software consumes perhaps 15% of the available CPU cycles, and the DBMS consumes approximately 20%. With another 10% allocated to the operating system, this leaves about 55% for application processing. Performance in this environment is excellent.

In stage two, new DB/DC applications slightly increase the impact on the DB/DC software processing environment. Data communications increases only 5% and

(Continued on Page 88)

SAS Operations Research Package Unveiled for Large IBM Systems

CARY, N.C. — SAS Institute, Inc. has announced an operations research software package for large IBM systems.

Called SAS/OR, the product includes procedures for scheduling projects and solving linear optimization models. It features tools for planning distribution strategies, solving transportation and assignment problems, evaluating investment profitability and determining product mix, a spokesman said.

Procedures are based upon linear programming and other operations research techniques. The two principal procedures are Proc CPM (critical path method) for analyzing activity relationships and establishing effective schedules and Proc LP (linear programming) for solving linear

programming models and reporting on solution sensitivity.

SAS/OR also features Timeplot, a plotting procedure for displaying schedules. A macro to convert IBM Mathematical Linear Programming Extended data sets to SAS data sets is included.

SAS/OR is fully integrated with other SAS products and requires the base SAS product, the spokesman noted. The software runs on IBM 370, 30 series, 4300 series and compatible machines under IBM's OS, VM/CMS, DOS/VSE and SSX operating systems.

The first-year license fees are \$7,500 for SAS and \$3,000 for SAS/OR from SAS Institute through SAS Circle, Box 8000, Cary, N.C. 27511.

OS/MVS-VSI USERS:

IF YOU'RE CONSIDERING JOB ACCOUNTING AND CHARGEBACK PRODUCTS...

... you must be concerned about controlling DP costs — and about getting the most from the resources you have. (Maybe you've even been getting pressure from Financial to "find a way to hold down costs!")

You need KOMAND, the DP Chargeback System! With KOMAND on your VSI or MVS system, you can:

- Collect all the true costs of any job or job step (including transaction charges for online applications, direct access space storage charges, costs of dedicated and communications equipment, and personnel costs for system design and programming services).
- Identify all costs by the user.
- Get the facts in a report, in minutes.
- Chargeback or allocate the costs to the user.
- Influence resource usage through economic incentives.
- Determine the real, accurate costs of using DP resources.
- Justify hardware needs through accurate utilization statistics.

Datapro had this to say about KOMAND: "All (interviewed) users unanimously agreed that the installation of KOMAND resulted in a dollar savings for their institutions."

In its 14 years of business, PACE has installed KOMAND in leading banks, corporations, governments and institutions worldwide. Some start with KOMAND/BASIC, which provides an inexpensive, fundamental job accounting package (with credit toward the larger KOMAND system as needs grow).

Many of our users had outgrown the limits of a competitor's job accounting package. Shouldn't you consider the best, right from the start? Call today for information and a free job accounting evaluator.

KOMAND

The Chargeback Specialists

PACE Applied Technology, Inc.
7900 Sudley Road, Manassas, VA 22110
CALL TODAY! 703/369-3200

Name _____ City _____
Title _____ State _____
Company _____ Zip _____ Phone _____
Address _____ Operating System _____

SOFTWARE & SERVICES

For Cobol Program Testing File Manipulation Tool Launched

SANTA CLARA, Calif. — XA Systems Corp. has announced Data-Xpert, an interactive file manipulation tool that is said to reduce the time and difficulty of creating and manipulating files for Cobol program testing, maintenance and support.

The product dynamically interprets the existing Cobol layouts, without modification, to define and manipulate files, a spokesman said. This eliminates the need to redefine files in another language when creating, viewing, updating, extracting, reformatting and printing files.

Data-Xpert is menu-driven with full screen displays, user-defined programmed function keys and on-line help facilities.

The product supports sequential, partitioned data sets, Isam and Vsam files; allows editing or browsing using a formatted screen consisting of the Cobol layout and data fields; provides automated interfaces to Pan-sophic Systems, Inc.'s Panvalet and Librarian products; prints the file contents in Cobol formatted model, three-line hexadecimal mode or single-line character mode; allows reformatting of file contents by provid-

ing specification of fields to be mapped from one Cobol layout to another; and allows selection criteria to be specified by entering the condition next to the Cobol names to select records.

Running under IBM's TSO/ISPF (Interactive System Productivity Facility), the product costs \$30,000 from XA Systems at No. 216, 3000 Scott Blvd., Santa Clara, Calif. 95050.

Service Targets Mapics Users

NEEDHAM, Mass. — Marcam Data Systems Corp. has announced an on-line support service for IBM Mapics users that connects the user's IBM System/34, System/36 or System/38 directly to Marcam Data System's facilities via data communications.

The Solution On-Line Value Extension program permits the firm's technicians to use in-house display terminals as though they were local terminals on the user's host computer, a spokesman said.

Installation fees range from \$2,000 to \$3,000 plus actual travel expenses. Semiannual charges range from \$3,000 to \$3,600 and include the first 50 hours of service. Marcam Data Systems is located at 123 Highland Ave., Needham, Mass. 02194.

Screen Generator Updated For CICS Users

ATLANTA — GT Software, Inc. has announced Release 4 of the company's Basic Mapping Support (BMS)/GT screen generator on IBM 3270-like terminals for IBM CICS users.

The company said that users of the package can design screens by keying in the data as they wish it to appear. BMS/GT supports line replication, full naming conventions, page building, header/trailers and the ability to retrieve any BMS-compatible map.

The new release is said to offer prototyping of screens, JCL management for on-line submission, production status maps and the capability to archive and restore maps selectively from a history tape. By invoking the prototyping facility, the company said, an end user can view the flow of a system before the programmer has written any code, allowing the end user to make any necessary changes. Through the production status capability, maps can be frozen in a read-only status to protect them from change or deletion.

A permanent license for the BMS/GT package, which is compatible with CICS 1.4 and higher releases, is available for \$5,500 for VSE and \$6,900 for VSI and MVS operating systems. GT Software is located at 1965 North Park Place, Atlanta, Ga. 30339.

'Secure/CICS' Extended To Support DL/1 Data Bases

SUNNYVALE, Calif. — Boole & Babbage, Inc. has announced an extension of its Secure/CICS data security feature to include support of IBM DL/1 data bases to the field level. Secure/CICS is an on-line security software package that monitors and controls information across IBM's CICS environment.

Secure/CICS Release 5.0.0 provides DL/1-CICS with security support for both IBM OS and DOS users and was designed to protect operators, terminals and transactions as well as to specify access

authorization.

The update protects system data bases and segments by name. In addition, the new release reportedly enhances the application interface facility.

Secure/CICS is priced at \$18,000 for systems running under the OS/MVS operating systems, \$13,500 for VSI and \$11,500 for DOS. Maintenance is provided free of charge for the first year and at 20% of the prevailing license fee thereafter. Boole & Babbage is located at 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

DOS/VSE and CICS/VS Frustration? BIM gets it out of your system.

BIM presents a line of proven programs that maximize your system's capabilities, saving you time, labor and expense. These program products help get the most out of your system and people.

- BIM-EDIT** — the editor with more than 25 significant features that ICCF can't match. **NEW**
- BIMSPPOOL** — Prints output in POWER/VSE spooling queue on local or remote 3270 terminal printers. (Received ICP Million Dollar Award 1982).
- BIMSPPOOL** — On-Line to Batch Print Spooling. Prints data passed from CICS application programs into the POWER spooling queue.
- BIM-PDQ** — POWER Dynamic Queuing performance enhancement. Eliminates 85% of the I/O to heavily used POWER queue. **NEW**
- BIM-ODIS** — Comprehensive problem analysis and display of operational CICS system.
- BIMTEXT** — Word processing, document composition system. Create formatted documents from free-form input.
- BIMSWAP** — Switch local 3270 BTAM terminals between multiple CICS partitions without special hardware or additional ports.
- BIMCMRPS** — CICS 3270 data compression system. Reduces response time for remote terminals significantly. Available for OS/VSI and MVS also.
- BIMP3270** — Comprehensive CRT screen image print facility. Copy to terminal printers or spool queue for system printer.
- BIMSERV** — On-line display of library directories and entries, VSAM Catalog entries, disk VTOC's, etc.
- BIMDSLOG** — Console Message File display. Used by computer operations and programmers.
- BIMMONTR** — DOS/VSE System Status, Performance Measurement, and POWER Queue display.
- BIMDEVIC** — Displays Logical Unit assignments for physical devices, to resolve operational problems.
- BIMSUBMT** — On-line Job Edit and Submission facility.

BIM programs are cost-efficient, many less than \$900. You can save even more with our group package offerings. Products are available on permanent, annual, or monthly leases, and shipped on a 30-day free trial basis. Product documentation is available on request.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 4331-2 system, on-site or remote.

BIM

B I MOYLE ASSOCIATES, INC.
5788 Lincoln Drive
Minneapolis, MN 55436

612-933-2885
Telex 910-576-3137

Member Independent Computer Consultants Assn.

**COLOR GRAPHICS
NOW AVAILABLE!**

VisiCalc® ELECTRONIC SPREADSHEET COMPATIBILITY On 3270's

If you want complete compatibility with the best selling electronic spreadsheet product for micros, join the 42 Fortune 500® companies that have already licensed

ExecuCalc™

the best selling spreadsheet product for mainframes running VM/CMS and MVS/TSO.

ExecuCalc provides all of the capabilities of the VisiCalc electronic spreadsheet product to your entire Information Center community for the cost of one micro. All VisiCalc commands and file formats (VC and DIF) are supported. Full compatibility means minimal retraining. In fact, we're so compatible that you may transfer worksheets back and forth between micros running the VisiCalc product and your mainframe running ExecuCalc.

Plus: Full screen data entry, variable column widths, help screens, and "virtual" worksheets (999 by 702). Worksheets are stored as CMS or QSAM files, so you can share, print, edit, backup, and interface to other software. Installs in 15 minutes. On site ExecuCalc training classes available.

Perpetual license: \$5000 per CPU. 30-day unconditional guarantee.

Parallax

Parallax Systems, Inc.
60 West 9th Street • New York, New York 10011
212-475-4001

VisiCalc® is a registered trademark of VisiCorp. ExecuCalc is a trademark of Parallax Systems, Inc. VisiCorp is in no way associated with Parallax Systems, Inc.

TSX-Plus Update Boasts RT-11 Compatibility

NASHVILLE, Tenn. — Version 4.0 of the TSX-Plus operating system, featuring increased virtual address space, enhanced user security and compatibility with the latest version

of the Digital Equipment Corp. RT-11 operating system, has been announced by S&H Computer Systems, Inc.

The operating system, which is

said to allow RT-11 users to work in a multiuser, multitasking environment, addresses up to 4M bytes of main memory on DEC PDP-11 systems that have either the extended Unibus or the 22-bit Q-bus together with the PDP-11/23 CPU.

In addition, TSX-Plus 4.0 provides the RT-11XM environment, which supports program logical address space. This allows programs as large as 3.5M bytes to run on the PDP-11 series if virtual overlays of arrays are used, a spokesman said.

The amount of memory available for a single program not using the virtual features has been increased from 56K bytes to 64K bytes.

TSX-Plus 4.0 supports up to eight logical disks per user, and access can

be restricted to specified logical disks at the time a user logs on. The files can be arranged either hierarchically or in parallel, with related files occupying neighboring physical disk space.

Compatible with Version 5.0 of RT-11, TSX-Plus 4.0 supports such DEC peripherals as the RA80 and RD51 fixed disk drives and the RX50 5¼-in. floppy disk drive. It also supports DEC's IND indirect command file processor, as well as RT-11's backup utility.

TSX-Plus 4.0 is priced at \$2,000 with an annual \$500 fee for support and the option to order upgrades. S&H Computer Systems is located at 1027 17th Ave. S., Nashville, Tenn. 37212.

Inquire/Disclosure Link Accesses Financial Data Base

FALLS CHURCH, Va. — Infodata Systems, Inc. has announced the Inquire/Disclosure System, a link between its Inquire fourth-generation language and the Disclosure II data base from Disclosure Partners of Bethesda, Md.

Disclosure II provides Securities and Exchange Commission information on over 11,000 public companies, a spokeswoman said. Inquire/Disclosure is menu-driven with menus for selection, reporting and utility functions. The data base contains historical financial information as well as searchable textual data such as descriptions of business, officers and directors, subsidiaries and management.

In addition to 20 standard reports, information can be accessed by a variety of search criteria, the spokeswoman said.

The system will be available in January. The full system, including the Disclosure II data base and the

full Inquire language, is licensed on an annual basis for \$32,000. Current Inquire users can purchase the front-end menu system for a one-time fee of \$5,000 and the Disclosure II data base for an annual fee of \$20,000.

Infodata is located at 5205 Leesburg Pike, Falls Church, Va. 22041.

Cobol Debugger From UCSC Out For Burroughs

NEWARK, Del. — University Computing Services Corp. (UCSC) has announced the Interactive Cobol Debugger (ICD) for users of Burroughs Corp. large systems.

The company described ICD as an on-line, interactive facility that enables Cobol programmers to suspend program execution dynamically when a fault occurs. The package allows data structures to be inspected or modified using source-level Cobol names, and it permits repeated testing and debugging without recompilation.

ICD is said to feature Help functions that permit the programmer to inquire about structure names or source statements. It is activated through a one-time compiler option, and the compiler is identical to the standard Burroughs compiler.

ICD is priced between \$5,000 and \$10,000, depending on options, from UCSC, 254 E. Main Street, Newark, Del. 19711.

BETTER
features
for an
unbeatable product. *That's what you get when you purchase this full-featured Digital Equipment Rainbow 100™ package from Continental Resources.*

For only \$3,895 you receive the basic system -- plus these extras!

- Upgraded 256K memory
- LOTUS 1-2-3™
- Complete on-site service
- Total software support
- Available rental options

Don't pass up this great opportunity. Continental can solve all your computer problems AND save you money!

Order now...

and experience life at the end of a BETTER Rainbow.

For a free demonstration, call the Continental office nearest you.

CONTINENTAL RESOURCES, INC.
175 Middlesex Turnpike, Bedford, MA 01730 (617) 275-0850

Bedford, MA
(617) 275-0850

New York, NY
(212) 695-3206

Santa Clara, CA
(408) 727-9870

Carson, CA
(213) 638-0454

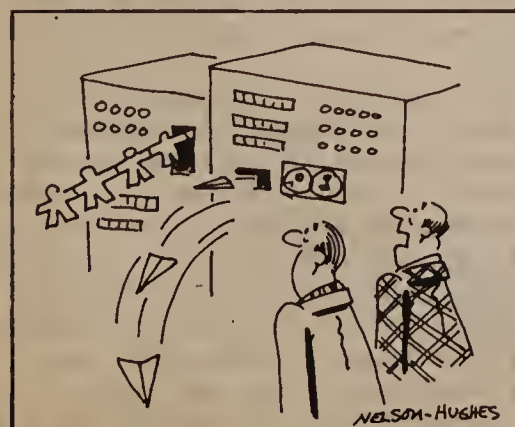
Bensenville, IL
(312) 860-5991

Gaithersburg, MD
(301) 948-4310

Scotch Plains, NJ
(201) 654-6900

Moorestown, NJ
(609) 234-5100

*Rainbow 100 is a trademark of Digital Equipment Corporation. LOTUS is a trademark of Lotus Development Corporation.



'They're Almost Human, Aren't They?'

Security Package Available for IBM's CICS

PLANTSVILLE, Conn. — TK Data Solutions has announced the Security and Terminal Operator Performance (Stop) software package, which the company said was designed as a security, performance and menu system for use with IBM's CICS Level 1.4 and higher.

All security entries are made online with the Stop system, thereby eliminating the need to modify and recompile tables or fixed code in programs, the vendor said. CICS remains active during Stop maintenance functions.

The package was designed to accommodate a unique password and identification for each terminal operator and reportedly allows personnel access only to the functions assigned

to them, a spokesman for the firm said.

The Stop system can be used to assign highly sensitive functions to a specific terminal or group of terminals.

An optional method of coding can be implemented to reduce operator entries, and the system also features encrypted security data, security sign-on field with darkened password field and a complete log of ter-

минаl sign-ons and security violations.

The DOS version of Stop costs between \$3,000 and \$5,000 from TK Data Solutions, through P.O. Box 392, Plantsville, Conn. 06479.

Don't Overlook Performance of DBMS

(Continued from Page 85)

data base increases only 10%, so that 40% of the CPU is available for application processing. Response time is still good.

In stage three, more and more applications have been added to satisfy growing end-user demand. But the results are devastating to the system. As the combined DB/DC usage has

increased by about 60% (80% vs. 50%), applications processing is reduced to one-fourth its previous level (10% vs. 40%).

At this point, any slight increase in existing DB/DC applications would degrade performance seriously. For example, a 10% increase to 33% and 55%, respectively, would reduce application processing avail-

ability to 2%.

It is important to recognize that this is merely an example. In reality, the vast majority of DB/DC users cannot accurately predict the impact of new applications on performance and CPU utilization until the applications are brought up in a production mode.

It is also important to consider the detrimental impact of nonprocedural software such as query system and application development products. They consume considerably more resources.

There is a need at this point to increase CPU power. But since the leverage is so stacked against application processing, any power upgrade is just a temporary solution. As development resumes, upgrades must be made faster and in bigger leaps.

A better approach is to correct the cause of the problem. For example, had it been possible to reduce the DBMS usage from 50% to 25%, the additional availability could go directly to more application processing.

This 25% increase in availability could produce a performance increase similar to a substantial increase in computer power. Even a small performance advantage in DB/DC software can produce a substantial increase in overall performance.

Since there are no great breakthroughs in direct-access device speed expected during the 1980s, execute channel program measurements are perhaps the most important of all DBMS considerations.

'Hybrid Relational' Tech

With the new technology known as "hybrid relational," values inherent within the data itself enable retrieval of associated records without using pointers or indexes. Reduced pointer and index maintenance overhead dramatically improves performance.

Main memory processing speeds, already much faster than direct access, are expected to continue to increase dramatically. Therefore, the best way to achieve a balance between DBMS performance potential and the current capabilities of data communications software is to move more of the data base accessing into main memory. This is not the logic needed to retrieve the data, but larger percentages of actual data of interest.

Further, if it were possible to reduce the number of pointers, indexes and tables stored and maintained on direct-access devices, overall throughput and performance would increase substantially. Thus, the two most critical factors in high performance systems are a large percentage of "in-memory buffer hits" and a substantial cut in pointer logic.

Breeze is a product manager at Cincom Systems, Inc. in Cincinnati, Ohio.



Tailor-made financing and leasing plans without all the red tape.

Flexible financing plus a streamlined application-through-closing procedure. Those are just two strengths that set us apart.

We'll also tailor-make loans and leases at fixed or floating rates. Create payback terms to match your cash flow structure. And design virtually any type of financing you desire: asset-based financing, capital equipment loans, working capital loans, leases, plus national and regional vendor programs.

What's more, our 25 offices across the country mean quick response. ITT's financial strength enables us to provide single source financing. And our professionals have already handled millions of dollars of financing for businesses just like yours.

Free Victorinox Swiss Pocket Knife just for meeting with one of our sales representatives. Attach your business card to this ad and send to: ITT Industrial Credit Company, P.O. Box 43777, Dept. E, St. Paul, MN 55164.

ITT Industrial Credit Company
We lend more than money.
We lend growth.

"If my system's so easy to use, how come it makes me uneasy to use it?"

Stop the shock...with Exxon office automation.

Today, many companies are shocked to discover that their "user-friendly" office systems are almost impossible to use.

Shock-free equipment

That's why at Exxon, we developed a full line of easy to use office automation equipment. Hardware and software designed not only to be user-friendly and ergonomic, but to complement the way people work.

For instance, with our EXXON 500 Series Information Processor, you can move through applications with screen prompts in plain English. And, if there's any confusion, an "explain" key will

call up step-by-step instructions to assist you.

Exxon makes everything easy

We make quiet ink jet printers that can print in many different typefaces automatically. And Qwip® fax machines and electronic typewriters that can be mastered in a matter of minutes..

Best of all, Exxon's self-paced training manuals let your people learn as they work. Even advanced applica-

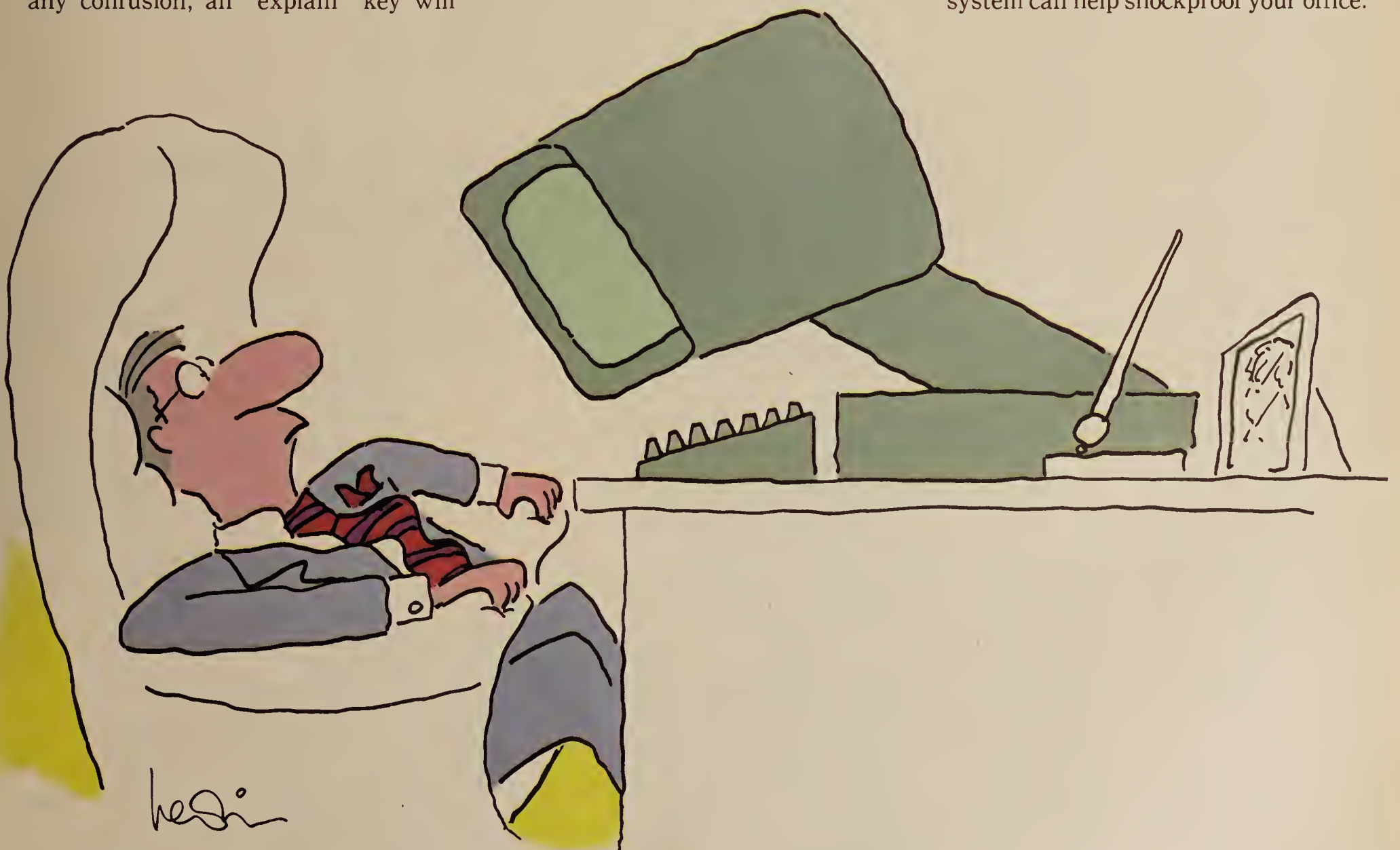
tions. So they can start being more productive right away.

No after shocks

And Exxon products are designed to work together as part of a fully integrated, easy to use office system. So what you buy today, can become part of a larger system tomorrow. And that should put your mind at ease.

For more information

Call 800-327-6666. Or write Exxon Office Systems, P.O. Box 10184, Stamford, CT 06904. We'll be happy to show you how an easy to use, fully integrated system can help shockproof your office.



EXXON OFFICE
SYSTEMS

The future...without the shock.

Qwip® is a registered trademark of Exxon Corporation.

Datamate Offers Report Writer for VAX-11s

TULSA, Okla. — Datamate Co. has announced the Enquery report writer for the

Digital Equipment Corp. VAX-11 series of supermini-computers operating in the

VMS environment.

The vendor said that Enquery uses an English-style

language to access user files through a data dictionary, and the package allows users to define their own English names for the data names in their files. The package features standard mathematical functions, and it allows for complex conditional statements from which the user may count, total and subtotal fields, a spokesman said.

The package's output can be printed or displayed and

is said to be formatted automatically in the program. A bi-level security system reportedly gives administrators the ability to choose the interactive capacity of each user on a report-by-report basis.

Enquery is priced at \$4,000 plus installation, the vendor spokesman said, from Datamate at Department CWA3, 4135 S. 100th East Ave., Tulsa, Okla. 74146.

'Zword/36' Bows for System/36

SAN RAFAEL, Calif. — Accusoft, Inc. has announced the Zword/36 software package, which the company said offers standard word processing functions to users of the IBM System/36 small business computer.

Zword/36 is said to allow users to insert information from the System/36 data base into documents and allows data from any file to be merged without reformatting. The system offers standard word processing functions such as user-definable tabs, global search and replace and automatic text wrapping and page numbering.

The vendor said the package allows users to merge

data by selecting from a menu of instructions. Zword/36 utilizes the full screen and can support line lengths of up to 132 characters. Users can access any section of the document by line

number or through a scrolling function.

The package is available for \$3,000, which includes a one-day training session, from Accusoft, 126 Alto St., San Rafael, Calif. 94901.

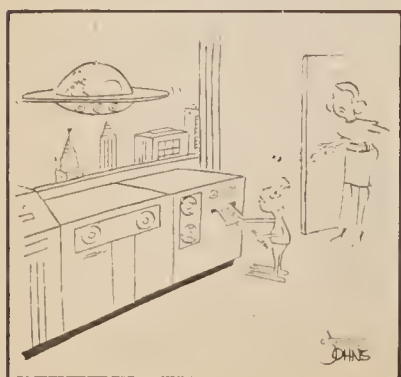
Planning Aid Announced For Wang VS

RICHMOND, Calif. — Soft Pro Systems, Inc. has announced the Project Management System for use with the Wang Laboratories, Inc. VS computer-series.

According to the company, the package is a project planning and management system that is designed to help project managers plan resources and measure actual resource status against planned schedules. The Project Management System is based on the critical path method analytic technique and is written in Cobol.

The package is said to feature on-line task maintenance, project schedule reports by work day or date, actual man-hour reports, calendar maintenance and resource planning maintenance. Reports include manpower planning reports and task source analysis, individual resource analysis and project task resource analysis reports.

The system is priced at \$5,000 per CPU copy from Soft Pro Systems, 4121 MacDonald Ave., Richmond, Calif. 94805.



'I'll Just Be a Minute.'

NCR COMTEN INTRODUCES ITS NEW 9600 BPS MODEM. BRILLIANCE RUNS IN THE FAMILY.



Program Processes Employee Medical Claims

NORTH HOLLYWOOD, Calif. — A system for the automated processing and administration of employee medical expense claims has been announced by California Interactive Computing, Inc. Called Dimed, the program allows partially self-funded, self-insured or self-administered employers to handle medical, dental, vision care and prescription claims.

Dimed includes a mix of on-line and scheduled processing program modules. The scheduled portion carries out a series of scheduled processing tasks and generates appropriate reports. On-line modules provide real-time inquiry and the development of special forms. In addition, optional modules can be provided for special functions such as the generation of personalized

form letters.

Information is entered via a video display terminal, using masks or menus on the screen. A data base management system and data dictionary facilitate the functions required for the administration, updating, storage and retrieval of claims and related data, the company said.

Processing functions of Dimed include on-line verification of eligibility cover-

age and claim status and computation of claim payment based on interpretation of plan coverage.

The Dimed system can generate personalized claimant correspondence, as well as print checks, drafts or vouchers, the company noted. In addition, it can provide management reports. A plan-modeling module allows a user to change figures, such as deductibles, to

make "what if" comparisons.

Available for use on a range of micro, mini and mainframe systems, the basic Dimed package is priced from \$18,000 depending on modules selected.

More information is available from California Interactive Computing, 12517 Chandler Blvd., North Hollywood, Calif. 91607.

Solids Model Available For HP 9000

ATLANTA — Catsoft, a three-dimensional solids modeling program from Catronix Corp., is now available for use on the Hewlett-Packard Co. HP 9000.

Designed for implementation at the level of engineering design and development, the solids model may then pass automatically to analysis, computer-aided design and manufacturing and publications systems.

Originally developed on a Digital Equipment Corp. PDP-11/23, Catsoft makes solids modeling possible on a number of 16- and 32-bit systems, the company said.

Purchase price for Catsoft is \$30,000 for a perpetual license; lease terms with the option to purchase are available from Catronix, Suite 800, 120 Ralph McGill Boulevard N.E., Atlanta, Ga. 30308.

File Tool Out For PDP-11

DUBLIN, Ohio — System Performance House, Inc. has announced the user file directory (UFD) optimizer, a record-like utility for Digital Equipment Corp. PDP-11 minicomputers under the RSTS/E operating system.

In addition to sorting on access or creation date in forward or reverse order, UFD sorts the most important files in the directory to the front of the directory.

The product costs \$250 for a one-time license from System Performance House, 5522 Loch More Court, Dublin, Ohio 43017.

COMTEN SERIES 7160

9600 • 4800 BPS

GOOD NEWS COMES IN FAST PACKAGES.

Now the NCR Comten modem family is more flexible than ever. A new 9600 BPS modem joins our 4800 BPS model to give you a broader line of SNA-compatible modems. Even better, the new 7165 is available in both point-to-point and multi-point versions. It's fully synchronous. It operates over unconditioned, voice-grade leased lines, transmitting in full duplex mode.

That's more good news from NCR Comten, the recognized specialist in data communications processing systems. The new Comten 7165 not only delivers the speed, it gives you the reliability that NCR Comten has engineered into all its 7160 family modems. And unlike sideband modems, it delivers full compatibility with Systems Network Architecture.

YOU GET DSP, QAM AND MAINSTREAMING.

Digital Signal Processing—DSP—controls mod, demod, dynamic equalization and more. In fact, DSP—not analog—handles 98% of the modems' functions. Your benefits? Faster problem determination than with old-style analog methods. Fewer problems on problem lines. And freedom from component drift. You also get QAM, Quadrature Amplitude Modulation, one of the fastest, most stable transmission methods in the industry today.

SNA-compatible NCR Comten modems use the entire bandwidth. You get greater transmission integrity than with sideband modems, without transmission interruption. Their extensive diagnostics are part of the system so you don't have to cope with separate processors or extra black boxes. They fit easily into existing SNA networks. And they're up to all the standards, from RS232, V.24 and V.28 right through the CCITT recommendations on the phone line side.

INCREASED UP-TIME FROM A BRILLIANT DIAGNOSTICIAN.

The Comten 7165, like our 4800 BPS modem, comes with a range of diagnostics that can be initiated automatically by the host, or by the operator. First, of course, full SNA compatibility means that the host itself acts as the diagnostic monitor. Self-test, power loss, signal quality tests—and more—are all designed to let you test, check and log from one location.

The diagnostics you control, right from the front panel, let you isolate user problems in the network. Interactive lights flash to indicate trouble—and tell you precisely where the trouble is.

THE FAMILY TO GROW WITH—AT A PRICE YOU CAN LIVE WITH.

Whether you've an SNA-compatible system or not, NCR Comten modems are the ones to grow with. Common family features and capabilities mean you won't get caught behind an electronic wall when it's time to expand your system. There's reliability, too. Our modems are rugged, easy to install and repair with your own staff. Or NCR Comten will do the installation and service wherever your site is.

Add in the support only a company with the resources of NCR can deliver, worldwide, plus a range of maintenance options that makes your job easier than ever before. You've got a flexible family of intelligent 4800 and 9600 BPS modems that deliver superior performance at a price that'll light up your life.

For more on the brilliant new Comten 7165, call or write NCR Comten, Inc., Dept. 8015, 2700 Snelling Avenue North, St. Paul, MN 55113. (612) 638-7944.



NCR

NCR Comten, Inc.

Information Hot Line 1-800/447-2935

Ask for Pam

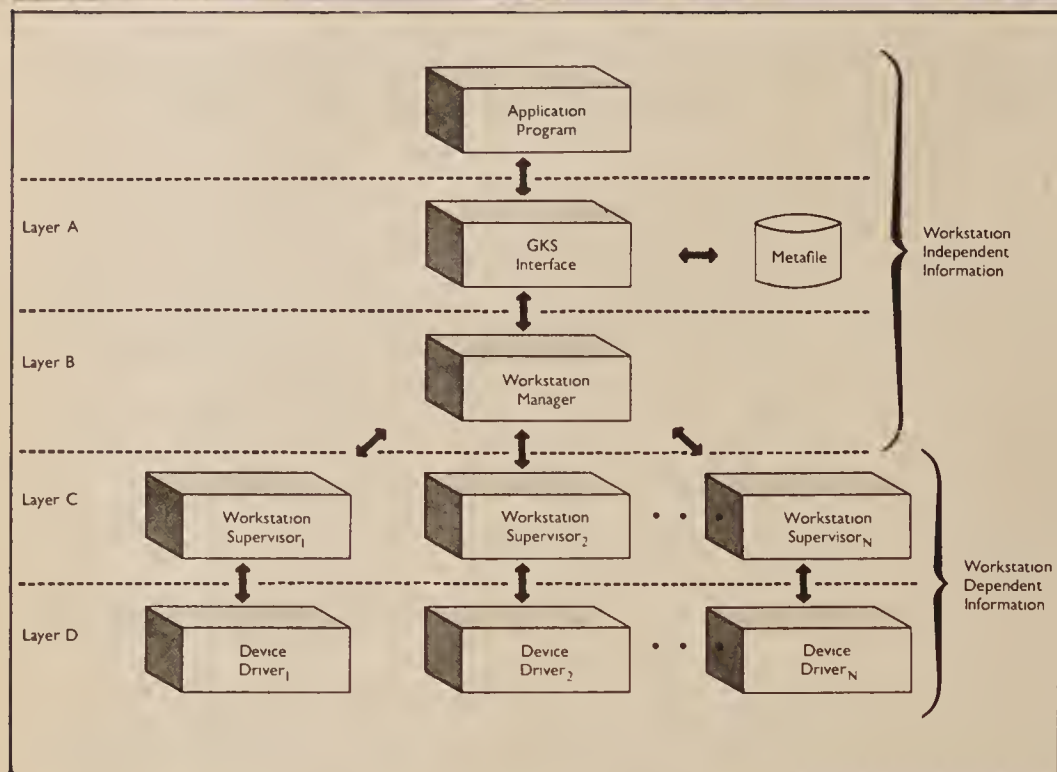
For CICS/DOS/VS(E) Inter-Partition Command Processor (IPCP)

IPCP opens and closes CICS files from batch partitions with a single execute statement.

- enable/disable transactions
- and many other CSMT functions
- eliminate PAUSE statements
- keep CICS up 24 hours
- free 30 day evaluation period
- \$950 one time or \$48/month

J. W. LAMPI, INC.

6160 Benjamin St. NE
Minneapolis, MN 55432
(612) 571-3934



Nova*GKS System Architecture

Nova Graphics International Chart

Nova*GKS Graphics Tool Incorporates GKS Standard

AUSTIN, Texas — Nova Graphics International Corp. has announced Nova*GKS, a graphics application development tool that incorporates the International Standards Organization's GKS graphics software standard.

Applications developed under Nova*GKS are device-independent and are transportable among several types of hardware, a spokesman said. GKS specifies a library of standard software programs that provides an interface between an application program and any number of graphics I/O hardware devices. It provides a consistent interface to application programs, giving the applications

programmer a common graphics model and standard syntax.

The product uses a multilayer architecture that consists of the GKS interface, a workstation manager with picture storage independent of the graphics device and one or more workstation supervisors, each handling a specific graphics device.

The system can be distributed between a host computer and a microprocessor-based graphics workstation in eight possible configurations. All portions of the system can operate on either the host or the workstation. Nova*GKS can be tuned to implement specific features of the hardware devices of various manufacturers, the spokesman said.

The Fortran implementation of Nova will be available in January 1984 at a cost of \$7,500. Nova Graphics is located at 1015 Bee Cave Woods, Austin, Texas 78746.

It took us five years to develop the best disk/tape manager.

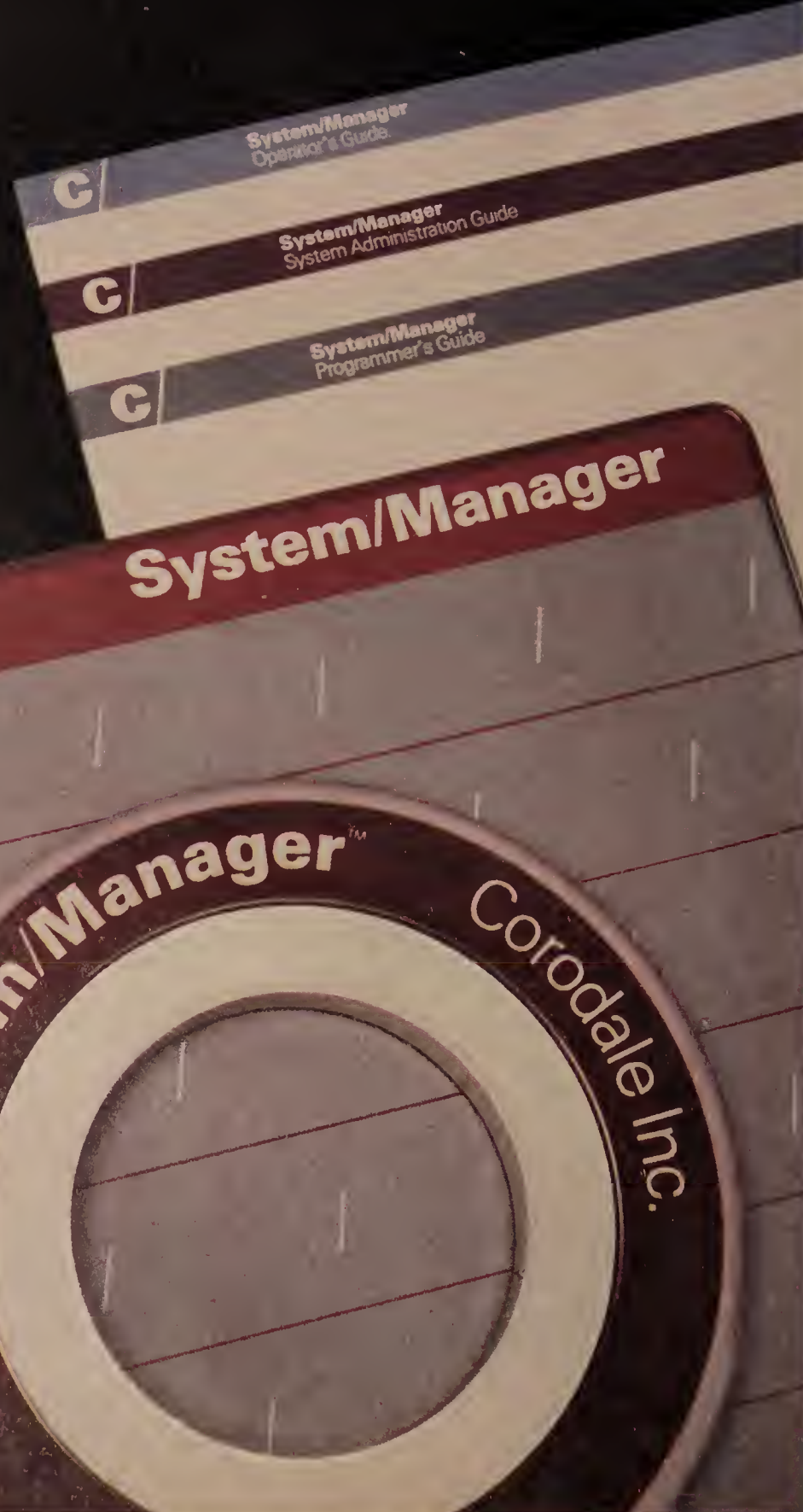
It will take you ten minutes to prove it.

That's all the time needed to have our System/Manager demonstration tape up and running.

And saving you money.

For a no-obligation, thirty-day trial, simply call 617-426-8780.

Or write us:
Corodale Incorporated
211 Congress Street
Boston Massachusetts
02110.



Fusion/1 Update, Fusion/2 Debut For System/34

LARKSPUR, Calif. — Fusion Products International, Inc. has announced the availability of Version 5.0 of the Fusion/1 information retrieval system and the Fusion/2 file management system for the IBM System/34.

The enhanced version of the two productivity tools now provides an IBM Personal Computer a retrieval interface that links System/34 files to personal computer programs such as Lotus Development Corp.'s Lotus 1-2-3, Visicorp's Visicalc and Ashton-Tate's Dbase II. It also allows user-defined output files in Ascii, Ebcdic or DIF formats including the virtual diskette facility from IBM.

Other enhancements to the Fusion systems include color attribute support, retrieval formatting that permits full user print position control, support of nonstandard paper form sizes, concurrent sort/select on any field in a retrieval over primary and nonprimary files and total and subtotal break calculations.

Provides Improved Support

In addition, the latest version provides multiple data dictionary support, improved file maintenance editing, improved file maintenance capacity and improved documentation and on-line help, according to the company.

Fusion/1 and 2 can also be integrated with Fusion/3, a financial modeling and electronic spreadsheet system, the company noted.

Licensed users of Fusion/1 with an active maintenance contract may upgrade to Version 5.0 at no charge. Single-copy licenses for Fusion/1 are \$3,500 with multiple-copy discounts available. Fusion/2 single-copy licenses are \$2,000 if bought individually and \$1,000 if purchased with Fusion/1. Fusion/3 is \$2,500 for a single copy. Fusion Products International is located at 900 Larkspur Landing Circle, Larkspur, Calif. 94939.

Tems Automates Recordkeeping

Communications Equipment Manager Debuts

NEW YORK — Commercial Software has announced the Telecommunications Equipment Management System (Tems), a product said to automate the recordkeeping activities of a large telecommunications system.

The product runs on Digital

Equipment Corp.'s VAX-11 superminicomputers.

Created to supplant much of the recordkeeping previously assumed by the Bell operating companies, the product provides detailed information about installed telecommunications equipment and services, pro-

vides information by which to evaluate rate increases, analyzes competitive proposals and reviews deployment of new equipment.

An order writer sees a "picture" of the phone, which includes organizational data as well as equipment information, a spokesman said. The system alerts operators of potential errors through the work-order creation process. For example, if an order attempted to disconnect a line attached to other instruments, a warning would flash, the spokesman said. When necessary, Tems automatically translates the equipment information into Universal Service Order Codes.

The system maintains pricing information for both installation and ongoing charges, the company claimed. It also maintains a series of reports indicating pending orders, orders on hold and orders that should have been completed. An inventory is automatically updated as orders are completed.

Tems provides two mechanisms for the reconciliation of vendor bills. It supports the cost allocation of telephone and telecommunications equipment to user departments and provides detailed inventory reports.

Tems costs \$55,000 from Commercial Software at 420 Lexington Ave., New York, N.Y. 10170.

DOS Version of 'JCLflow' Receives Enhancements

DOWNERS GROVE, Ill. — Consumers Systems Services Group, Inc. has announced a series of enhancements to the DOS Version of the company's JCLflow application documentation software package.

They include simplified execution Job Control Language to reduce system implementation modifications, expansion of the program file to include the identification of Copy books, Sort and Idcams (IBM's Vsam file utility program), control card review logic to correct documentation of those utility programs, a report function that produces a cross-referenced list of program Call and Copy books and automatic replacement of program information on the program master file.

The company said the JCLflow system provides an automated tool with which users can develop a standardized library of systems documentation. A DOS version of JCLflow is also available, and both the OS and DOS versions are priced

at \$7,500 from Consumer Systems, 1100 31st St., Downers Grove, Ill. 60515.

Mailer's Choice Splits Files Into Groupings

LOMBARD, Ill. — List Processing Co. has released Mailer's Choice, a sorting, addressing and printing system that can split an address file into 99 major groupings, each including any or all records from the user's file.

Mailer's Choice can print mailing labels, bag tags and sack, tray and pallet summaries and reports in U.S. Postal Service-approved formats. Printed one split at a time, mailing labels can be separated for various publications and multiple versions of the same publication, the company explained.

Users of Mailer's Choice can obtain presort discounts on a variety of Zip Codes and carrier route codes, as well as "firm package" multiple second-class pieces for the same address as one piece.

Other features of the system include the ability to generate a file of label images ready for ink-jet printing, adjust sack weights, alter the contents of fixed fields within records, duplicate mailing records and generate match codes.

Mailer's Choice operates under DOS or OS on an IBM 4300, 370 or equivalent system and is available for \$17,500 under a perpetual license agreement. List Processing can be reached at 555 Waters Edge, Lombard, Ill. 60148.

VM

Information Center Developmental Center

VM Software Shopping Center? [Great Idea!]

If you've considered implementing an Information Center or Development Center under VM, you've discovered two things:

- 1 VM can't be matched, for fast interactive response time, flexibility and user friendliness. It's a *great* product from IBM!
- 2 System software products to help you manage your VM Center just aren't available from your traditional DOS/MVS software vendors, nor from IBM.

Welcome To The VM Shopping Center

VM Software, Inc. has exactly the software products you need, to be effective with VM from the start.. As much or as little as you need. From the undisputed leader in VM products.

VMBACKUP

- Saves up to 90% of time by dumping only changed data
- Dumps all data—both CMS and non CMS
- Protects tapes and saves space with multivolume SL tapes
- File, minidisk, and full pack restores done easily
- Full screen restore, standalone restore, and more

VMACCOUNT

- Complete collection, costing, and reporting online
- Flexible algorithms, account structure, and displays
- Project accounting, Product accounting, budget cutoff and more
- Capacity planning

VMARCHIVE

- Saves space by moving utilization data to tape or disk in compressed format
- Complete audit trail of activity

VMTAPE

- Provides flexible control by managing any number of tape volume series and tape drives
- Supports SL tape usage
- Eliminates operator tasks
- Full DOS/VSE guest support

VMLIB

- Shared file facility for CMS
- Saves space (usually 50%), provides auditability and version tracking
- Allows synchronization of source and object code
- Interface to DOS and OS systems

VMSECURE

- Comprehensive security for VM
- Comprehensive directory management allowing user group space and resource administration
- Permits encryption of data with no source code changes
- Simple end user command language

VMSCHEDULE

- Permits users to schedule their virtual machine on any basis
- Allows load balancing of CPU by permitting events to be run in off prime
- Serves as substitute for CMS BATCH
- English language commands

If your needs change later, or if you don't like the way we implement something (it happens), turn in one product for a different one at no extra charge. (Even one of the new ones we're planning). Now, what could be fairer than that? We're good, we know we're good, so we take a little risk.

More than 600 of the largest companies in the world are already using our VM products including 35 of the Fortune 50. (We won't tell whether number 38 is on the list). That's because we offer the best VM products available—anywhere. Call us, write us, but if you're looking at VM, you can't afford to ignore us.

**Call Us
703/821-6886
or Write**

VM Software, Inc.
2070 Chain Bridge Road,
Suite 355
Vienna, VA 22180

Name _____

Title _____

Company _____

Address _____

City _____

State _____

ZIP _____

VM

Software Inc.

Phone () _____

CPU: _____

This is IT.



IT* is...

... an integrated set of easy-to-use, microcomputer programs that can transform your desktop computer into a total information center. Ten programs, each separately available, make ITSoftware the most comprehensive and flexible software system available for personal computers.

The core program is KeepIT, a menu-driven, relational data base management system. Not only does KeepIT integrate the entire ITSoftware series, but also all your other popular micro-based software. Get all the benefits of individual programs, plus the convenience of shared data among programs. Use our programs or yours!

KeepIT manages data with the flexibility of a fully relational data management program and the ease of use associated with prompts and menus. It provides inputs to other ITSoftware programs or to your own word processor, spread sheet or graphics programs.

CalcIT is a powerful 3-D spread sheet program with advanced arithmetic and graphing features.

LinkIT is a menu-driven, asynchronous communications package that links your PC to mainframes.

PassIT provides file transfer capability for your 3270 emulation boards.

SortIT is the fastest sort/merge utility available for your PC with flexible file formats, up to nine sort fields and unlimited file sizes.

EditIT is a full-screen color program editor with easy-to-use windows and mouse management.

StatIT is the leader in micro-based statistical software. Its features include crosstab, transformation, correlation, ANOVA, regression, probit and logit models, conjoint analysis, chi-square AID and two-stage least squares.

ShowIT is a state-of-the-art business graphics and drawing program with direct data transfer from CalcIT and KeepIT.

SendIT allows you to prepare slide shows with ShowIT and simultaneously send them to multiple locations.

As examples, KeepIT provides input to programs for:

Word Processing	Spread Sheets	Graphics	Statistics	Communications
MultiMate	1-2-3	1-2-3	MicroStat	All Others
Wordstar	MultiPlan	BPS Graphics		
WordPerfect	VisiCalc	FastGraphs		
WordPlus-PC	SuperCalc	Graphwriter		

These products are registered trademarks.

WritIT provides the latest in word processing features and easy integration with mail lists and tables provided by KeepIT.

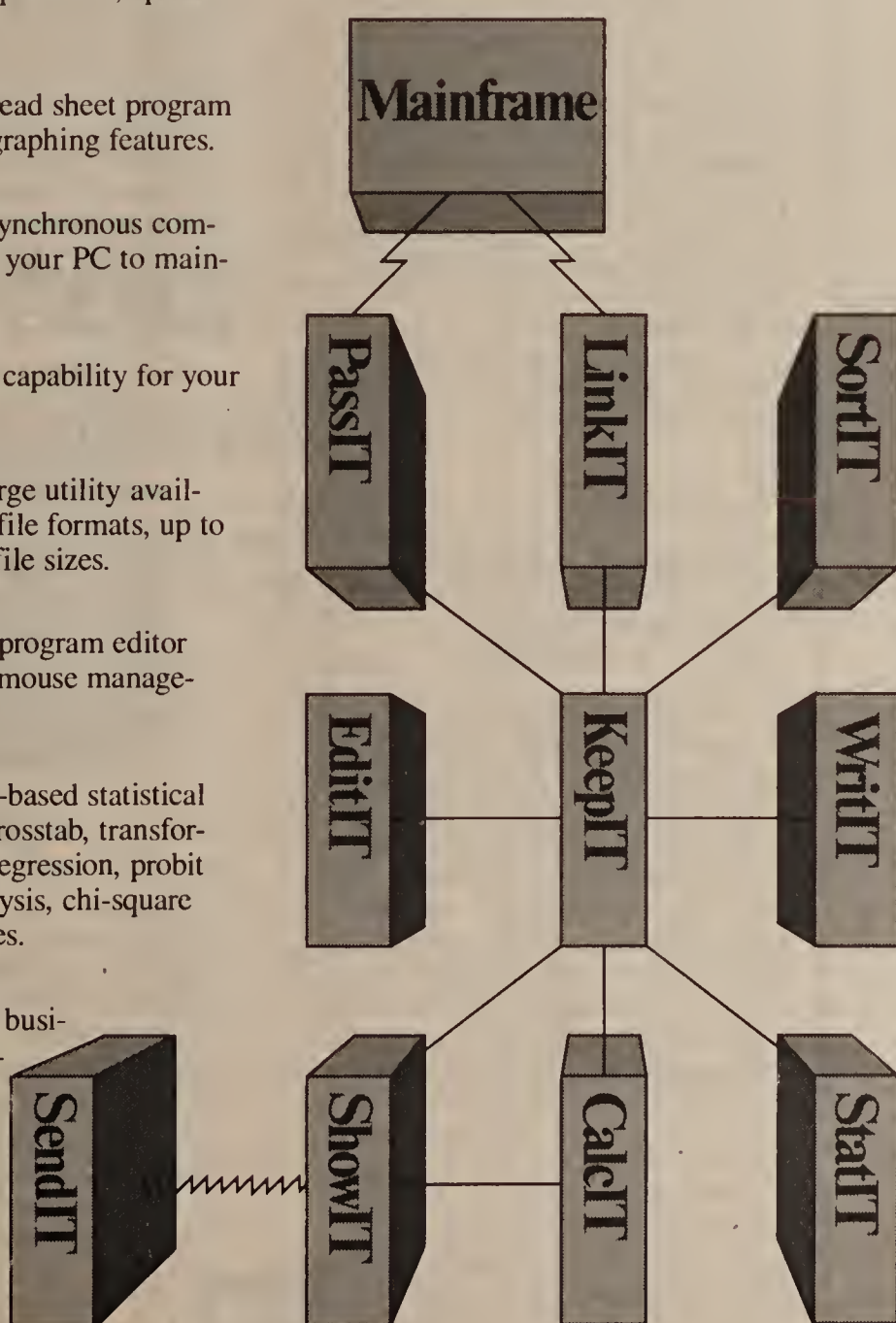
Use IT

Powerful, flexible and easy to use, ITSoftware can meet your information management needs with ten fully integrated programs. And there are more on the way. Martin Marietta Data Systems is continually expanding to keep pace with today's dynamic micro marketplace.

Buy IT

ITSoftware ... ask for IT by name. For more information call (800) 222-0592. In New Jersey: (609) 799-2600. Or write ITSoftware, Marketing Services, P.O. Box 2392, Princeton, New Jersey 08540. We'll send you a free brochure.

*from the company that brings you RAMIS® II mainframe software.



Please send me more information on how I can turn my desktop computer into a total information center.

Name _____

Company _____

Title _____

Address _____

City _____

State _____

Zip _____

() _____

Phone No. _____

MARTIN MARIETTA

Martin Marietta Data Systems

Includes 3-D Data Base

'Design Graphix' Fits RSX-11M

BATON ROUGE, La. — Engineering Systems Corp. recently announced a computer-aided design and drafting software product for Digital Equipment Corp.'s RSX-11M operating system.

The product, Design Graphix, reportedly includes a three-dimensional data base, multiple pens and multiple layer drawing construction, geometrics, user-definable symbols and figures, and graphics and text editing.

Other features include user-definable menus, command file processing, a mac-

ro programming facility and various utilities, according to a spokesman. The product reportedly links with Fortran programs and offers Teach, an on-line programmed instruction course, and a Help facility to speed learning by in-house personnel.

Software options range from single workstation versions to multitasking versions supporting multiple workstations. The system reportedly supports a variety of peripherals such as graphics displays, digitizers, plotters and magnetic tape.

The product is available for under \$20,000 from Engineering Systems, P.O. Box 80318, Baton Rouge, La. 70898.

'Maps/AP' Designed For VAX-11

PALO ALTO, Calif. — An interactive accounts payable package with cash management features, designed for use on the Digital Equipment Corp. VAX-11 supermini-computers, has been announced by Ross Systems, Inc.

Maps/AP handles such tasks as payables processing, check writing, vendor information, cash management, inquiries and reports. Designed to be integrated with other Ross software, Maps/AP can be used with the general ledger/financial management package, Maps/GL, to update payables automatically to the general ledger and provide a general ledger distribution by multiple account structures.

Other features of Maps/AP include user-defined reports, automatic allocations by vendor and a vendor directory, as well as a distribution preview, which allows the user to look at any detail combinations in any order of the five possible elements that make up the general ledger account code.

Maps/AP will be available in January at a cost of \$15,000 to \$20,000 depending on the VAX model.

Ross Systems is located at 1860 Embarcadero Road, Palo Alto, Calif. 94303.

Course Supported By Video

WESTWOOD, Mass. — Cullinet Software, Inc. has announced a video-based training series to complement the course offered at its National Education Center.

Cullinet users can acquire video-based training courses on the basic components of IDMS; Integrated Data Dictionary; Application Development System/Online; and IDMS-Data Communications/Universal Communications Facility.

Course prices range from \$4,000 to \$8,500, and all five are available for \$30,500; annual renewals are available for 10% of the purchase price. Cullinet is located at 400 Blue Hill Drive, Westwood, Mass. 02090.

'Word-11' WP Enhanced For VAX-11 Under VMS

ANAHEIM, Calif. — Data Processing Design, Inc. (DPD) has announced an upgrade of its Word-11 word processing package for Digital Equipment Corp.'s VAX-11 superminicomputers under the VMS operating system.

In Version 3.0, Word-11 is converted from Macro-11 mode to Macro-32 mode, which reportedly eliminates the need for it to run in a compatibility mode and provides for faster operation. The package also provides expanded management and

support for additional output devices, including laser printers, according to a spokesman.

Features include an advanced system management utility, scientific character set support for DEC's VT100 terminals and Diablo Systems, Inc.'s 630-ECS printer.

Version 3.0 supports DEC's VMS Version 3.4 and will be available in late 1983. It is priced at \$9,500 for large VAX systems and \$8,500 for small VAX systems. DPD is located at 1400 N. Brasher, Anaheim, Calif. 92807.

ANNOUNCING

TSPRINT

Direct Spool to 328x, 3262,
and ASCII PRINTER Support

VS1 and MVS	BTAM and VTAM Support
JES, JES2, or JES3	Full FCB and UCS Support
Local and Remote Printers	No System Mods Required

Shares Printers With Other Applications

Worldwide Support

Free Trial

1735 S. Brookhurst
Anaheim, CA 92804
(714) 991-9460 Telex 181592

SEE IT IN ACTION.



30 day free trial ...
judge the results for yourself.

Quikjob™

Quikjob is a one-step load and go program for one time report writing, fast file creation and dataset quick fixes for use with IBM Mainframes, UNIVAC 90 Series and System 80. • Uses free-format English-like language • Complete and fast, most programmers start using Quikjob after just ½ hour • Generates reports in hours, not days, and updates files faster than you might think possible • Rental or purchase basis • It's quick, complete, and affordable — as low as \$125 per month! Try Quikjob FREE for 30 days and see for yourself. Over 1,000 users worldwide.

Call toll free 1-800-551-6666 for complete information.



SYSTEM SUPPORT SOFTWARE
5320 Springboro Pike
Dayton, Ohio 45439
(513) 435-9514

CBT ISPF FOR NEW USERS

A COMPUTER BASED TRAINING COURSE covering the most commonly used features of IBM's ISPF.

Ideal for the END USER or the TECHNICAL PERSON just getting started with ISPF.

EVALUATE FREE FOR 30 DAYS.
PRICE: \$1,950 to purchase or \$85 per month to lease.

CALL or WRITE for more details.

ISPF for NEW USERS is 100% self instructional.

Realistic simulated displays and responses give the student the feeling of actually being in IBM's INTERACTIVE SYSTEM PRODUCTIVITY FACILITY.



MVC ASSOCIATES, INC.
849 N. SUMMIT AVENUE
LAKE FOREST, IL 60045
312/295-3344

IBM 3270 Protocol Conversion as low as \$665 per channel

BISYNC
SNA/SDLC



ASYNCR ASCII
CRT'S
PRINTERS
PC'S



DATALYNX™/3274

- Emulates IBM 3274-51C up to 19.2 kbps
- 5-9 async PCs, CRTs and printers in emulation of 3278 or 328X to 1 or 2 hosts
- PC support for IBM PC (\$60), HP-120/125, Apple II/III, Xerox 820, Osborne, VT-180, Rainbow, COMPAQ, TRS 80-II, Direct, Etc.
- File transfer program for IBM PC
- User-friendly menu setup
- Screen painting for fast response
- Password security and inactivity disconnect for dial-up users
- Concurrent 3278/3287 operation on one port



LOCAL DATA

2701 Toledo St.
Torrance, CA 90503

Phone: (213) 320-7126
TELEX 182518

A WORD TO ANYONE LOOKING FOR UNIX™ TRAINING:

Guaranteed.

Introducing Vision. The first UNIX Interactive Videodisc Training Curriculum. And our 30-Day Money-Back Guarantee.

Simply lease any one of three Vision Courses: UNIX Overview, UNIX Fundamentals or 'C' Language Programming. If you're not satisfied, for any reason, return it for a full refund. No questions asked.

A Free IBM PC and Laser Discplayer.

Lease all three Vision Courses for one year. And we'll give you the use of a complete interactive videodisc system at no extra cost. You get an IBM PC, laser videodisc player, color monitor and Interactive Training System Controller. Absolutely Free.

Training in Action.

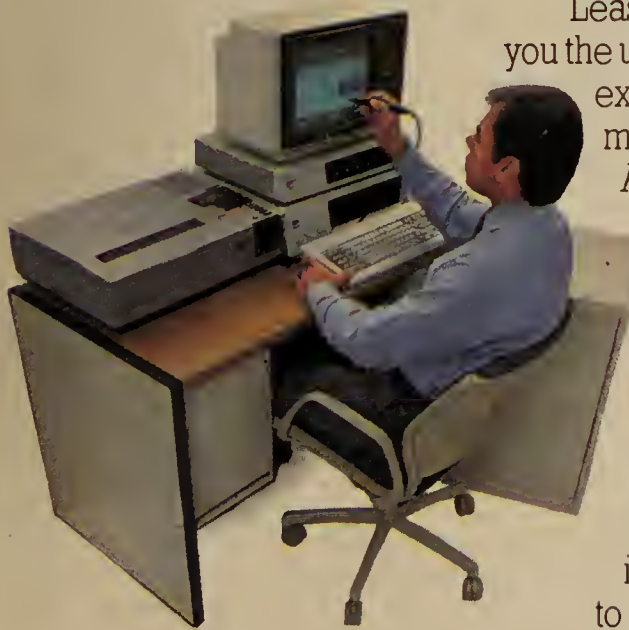
Interactive video training combines the power of the computer, the speed of a laser disc and the personality of classroom instruction. To involve, to motivate, to excite. To capture and hold a student's interest in a way no other medium can.

Students learn by doing, so they learn faster, comprehend better and retain information longer. Because training is targeted, they learn only what they need to know to do the job. Now.

What's more, Vision was developed by Interactive Training Systems, the acknowledged leader in interactive video training. And Computer Technology Group, a leader in UNIX training.

The result? UNIX training so fast, so effective and so affordable, we back it with a full 30-Day Money-Back Guarantee. (Frankly, it's one guarantee we're confident you'll never get to use.)

Send us the attached coupon. Or call us at (617) 497-6100.



AFTER MARCH 31, 1984 OUR FREE INTRODUCTORY OFFER IS NO LONGER FREE!

☐ Please have a representative contact me immediately.

☐ Please send me more information about Vision, the UNIX Interactive Video Training Curriculum.

Name _____

Company _____

Title _____

Address _____

City _____ State _____ Zip _____

Telephone _____



Relational DBMS Available For DEC Professional Models

BETHESDA, Md. — Contel Information Systems, Inc. has announced that its RT-File relational data base management system (DBMS) is available for the Digital Equipment Corp. Professional Computer 325 and Professional Computer 350 systems.

At the same time, the company introduced an RT-11 emulation system, called Virtual RT-11 (VRT), for users of VAX-11 computers.

RT-File now provides Professional Computer 300 series users with menu-driven, forms-oriented utilities that are said to enable nontechnical personnel to perform tasks such as sorting files, performing calculations and selecting records.

The RT-11 version of RT-File has been bundled with the PRO/RT-11 operating system, which supports both runtime applications and program development. Virtually all RT-11 single-job applications and utilities will run under PRO/RT-11, according to Contel. The PRO/RT-11 and RT-File package, including an RT-11 license, costs \$1,500.

VRT includes a Virtual Exchange Program, which allows users to move files between RT-11 and Files-11 formats. VRT programs may access files in both formats, Contel noted.

VRT is priced at \$1,750. Contel is located at 4330 East-West Highway, Bethesda, Md. 20814.

IBM Micro Nets Get DBMS

SANTA CLARA, Calif. — A relational data base management system (DBMS) designed for local-area networks of IBM Personal Computers has been announced by Software Connections, Inc.

The product, LAN:Datastore, supports a variety of local-area networks and offers end-user security and record-level locking, a spokesman said. Security is defined at the field and record levels, and users can be limited in ability to read, update, delete and add records. Audit trails are provided.

Help messages and menus are provided for novice users, but can be bypassed by function-key and mnemonic-driven commands, according to the vendor spokesman.

A full screen editor is provided for

screen printing.

The data base handles up to 16M bytes of storage and does not limit the user to a fixed number of records. Each record can be as large as 16K bytes and can contain more than 500 fields. A report writer is included.

The single-user version costs \$495, and the network version costs \$1,945 per Personal Computer, according to the vendor. More information can be obtained from Software Connections at Suite 17, 1800 Wyatt Drive, Santa Clara, Calif. 95054.

Trademark File Now Available On Dialog

PALO ALTO, Calif. — Dialog Information Services, Inc. has announced that the Trademarkscan data base of more than 600,000 registered U.S. trademarks is now available through the company's Dialog Information Service.

According to the company, the Dialog service is available through word processors and microcomputers with communications capabilities and offers more than 180 data bases containing 80 million items of information.

The Trademarkscan data base, compiled by Thomson and Thomson, Inc. of Boston, Mass., reportedly tracks active trademark registrations of the U.S. Patent and Trademark Office.

Through Dialog, a user can access Trademarkscan and perform a trademark search immediately, according to a spokesman for the firm. The data base is designed to allow researchers to scan by the trademark, owner, a description of the product or service or through a prefix, suffix and letter string searching feature.

The company said there is no subscription fee or minimum usage charge to access Trademarkscan, and charges will be based on the \$85 per connect hour fee.

Additional information is available from Dialog Marketing, located at 3460 Hillview Ave., Palo Alto, Calif. 94304.

Adage 3000 Gets Program Tool

BILLERICA, Mass. — Adage, Inc. and Intermetrics, Inc. have announced a high-level programming system for use with the Adage 3000 Color Raster systems on Digital Equipment Corp. minicomputers.

Icross 3000, developed by Intermetrics, is reportedly styled after the C programming language and supports compilations of microcode modules for the Adage 3000 bipolar BPS32 microprocessor.

Spokesmen for both the companies said the package allows subsequent link-editing to produce load modules for microprocessors that can be downloaded directly after compilation.

The package is available for \$7,500, the vendor said. Adage is located at One Fortune Drive, Billerica, Mass. 01821.



Trying to solve abends using these hex dumps can really tea a person off.

The Boston Dump Party.

It was no party trying to solve program abends or cancels using the old-fashioned hex dump. In fact, it was a downright taxing job.

Data Processing Managers used to go around harboring great concern about what effect these unwieldy dumps had on productivity.

Using the old-fashioned hex dump with all the additional manuals, calculations and cross-referencing was a revolting situation. Like taxation without representation.

Then came one of the Greatest Moments in Dump History. Abend-AID.

Abend-AID transfers the burden of debugging from the programmer to the computer, thus giving the programmer liberty instead of dumps.

Abend-AID also gives you the proper representation up-front, in the King's English. Abend-AID tells the programmer what happened, where it happened and how to fix it.

Abend-AID is available for both IBM OS and DOS installations. Listed below are unique Abend-AID options for your specific needs.

☐ **Abend-AID/COBOL** — The first practical source level debugging tool.

☐ **Abend-AID/SPF** — 80 column "easy-to-use" viewing capability which permits programmers to interactively debug abends at their terminals.

☐ **Abend-AID/ONLINE** — 80 column CRT output for easy viewing.

☐ **Abend-AID/DOS/DLI and Abend-AID OS/IMS.** Features special diagnostic routines for IBM's data base systems.

Free Abend-AID Product Evaluation.

For additional product information or to arrange for your 30 day FREE evaluation of Abend-AID, just give us a call at 800-521-9353 (in Canada or Michigan, 313-540-0400) or clip your business card to this ad and mail it to: Compuware, Systems Software Division, 32100 Telegraph Road, Birmingham, Michigan 48010

Be brave. Get aboard.

Try Abend-AID.

It's a programmer's cup of tea.



Corporate Headquarters
32100 Telegraph Road
Birmingham, Michigan 48010
(313) 540-0400

International Offices: New South Wales, AUSTRALIA Phone: (61-2) 816-1177/Luton, Bedfordshire, ENGLAND Phone: (44-582) 28-463/Paris, FRANCE Phone: (33-1) 247-1341
Herzliya, ISRAEL Phone: (972-52) 58912/Milano, ITALY Phone: (39-2) 345-2211/Tokyo, JAPAN Phone: (81-3) 479-1600/Oslo, NORWAY Phone: (47-2) 56-5570
Bryanston, SOUTH AFRICA Phone: (27-11) 878-5600/Hamburg, W. GERMANY Phone: (49-40) 23-3251.

COMPUWARE
SYSTEMS SOFTWARE THAT MAKES SENSE



For Florida school officials, menu-driven applications come Naturally.



NATURAL Fourth-Generation Information Processing System

With nearly a quarter of a million students, Florida's Dade County School District could have been an administrative nightmare.

Instead, it's a perfect demonstration of how Software AG's NATURAL and ADABAS can make things easier for everyone from superintendents to first-graders.

NATURAL is Software AG's fourth-generation online application development—the system with the largest installed base of its kind in the world. NATURAL is one of the most powerful programmer productivity tools around: typically 10 to 20 times more productive than COBOL.

And NATURAL is backed by ADABAS, Software AG's widely imitated (but never equalled) data base management system—the system that's given more people a taste for relational architecture than any other DBMS.

With the help of NATURAL and ADABAS, Dade County officials now have a system that combines everything from electronic mail to centralized food purchasing for over 250 schools—while keeping track of each student's performance and needs.

So, whether you're managing a lunch program or just trying to digest a lot of information, you owe it to yourself to find out what NATURAL and ADABAS can do for you. We'll be glad to show you the rest of our menu.

Software AG of North America, Inc.
11800 Sunrise Valley Drive
Reston, Virginia 22091
(703) 860-5050

Copyright 1983. ADABAS and NATURAL are trademarks of Software AG of North America, Inc.

Tool for Oil, Gas Industry Runs on Datapoint Processor

DALLAS — Hal Systems and Services, Inc. unveiled a software package for the oil and gas industry that runs on Datapoint Corp. processors.

The Lease Management System includes a separate contract section that can be linked to leases or individual owners, a spokesman said. Users can also specify multiple owner sections per lease, unlimited special obligations and a shut-in royalty cycle to pay owners automatically. Leases can be designed from up to 17 separate information sections. Ten different budget reports, three separate formats and up to 99 different reports can be defined, the spokesman noted.

The Lease Management System costs \$12,500 from Hal Systems and Services at 14840 Landmark Blvd., Dallas, Texas 75240.

'Catsoft' Available on HP 9000

ATLANTA — Catronix Corp. has announced that its Catsoft three-dimensional solids modeling program is available on the Hewlett-Packard Co. HP 9000 desktop computer.

Implemented at the level of engineering design and development, the solids model reportedly

SANTA SUSANA, Calif. — Ventura Computer Systems, a division of Tri-Delta Corp., has announced Superzap/38, which is described as a productivity aid that enables direct access of records in any data base file on the IBM System/38.

may pass electronically to analysis, computer-assisted design and manufacturing, publication and manufacturing systems.

The purchase price is \$30,000, with lease terms available from Catronix at Suite 800, 120 Ralph McGill Blvd. N.E., Atlanta, Ga. 30308.

Tool Out for System/38 Users

Once the system has verified that System/38 security has been cleared, records can be requested for display, and records in logical and keyed physical files can be located by key. Once a record is displayed, a user may scroll forward or backward through the file, modify the displayed record in character or hexadecimal mode and rewrite it to the disk or delete it, a spokesman said.

Superzap/38 allows programmers to modify test file data and provides direct access to disk information. The package is available for \$750 from 1411 Kuehner Drive, Santa Susana, Calif. 93063.

Financial Aid Introduced For DG Products

SEATTLE — Minicomputer Modeling, Inc. has announced a financial modeling system for Data General Corp. Eclipse, MV, Micro Eclipse and Desktop Generation computers running DG's AOS and AOS/VS and Microsoft, Inc.'s MS-DOS operating system.

Data Model is a menu-driven system for financial modeling and spreadsheet management. Using a virtual spreadsheet design, Data Model reportedly allows an unlimited number of individual spreadsheets to contain 500 columns and 30,000 rows. Multidirectional consolidation capability permits any number of consolidations to be performed in any direction, the company said.

Data Model includes data projection and built-in financial routines. A time-slice reporting feature allows users to summarize and print spreadsheet rows or columns in any order, perform mathematics at report time and duplicate any current report forms, the company noted.

Permanent license fees for Data Model start at \$1,295 from Minicomputer Modeling, Suite B, 1507 Queen Anne Ave. N., Seattle, Wash. 98109.

Report on MRP Gets Updated

ESSEX JUNCTION, Vt. — Manufacturing Software Systems, Inc. has published an updated version of the company's research report on guidelines for a closed-loop Material Requirements Planning (MRP) II software system.

Titled "MRP II Standard System," the publication also includes evaluations of 25 of the most popular of these packages. The guide is said to offer information on developing or modifying MRP II software in-house. The vendor said the findings contained in the publication were based on the experiences of successful MRP II user companies.

The "MRP II Standard System" is available to owners of the older version for \$125 and to new customers for \$800 from Manufacturing Software Systems, Publications Department, which is located at 85 Allen Martin Drive, Essex Junction, Vt. 05452.

Introducing applications software that will make you a hero in your company.

Computer Associates scores a long-awaited breakthrough:

Business applications software that fills all your end users' needs — and delivers all the technical expertise and support you require too.

We started with our ten years of solid experience in designing highly efficient, highly productive systems software products. Then we collaborated with professionals who know day-to-day business problems to develop the *Advanced Business Software Series*.

Because these software packages are from Computer Associates, they are not only designed to fulfill specific end user needs, they are also engineered to enhance the overall productivity of your data processing operation.

Our *Advanced Business Software Series* consists of separate components which independently provide powerful, specific solutions and together combine to form comprehensive business systems for every operation in your company.

This broad range of business solutions includes general ledger, accounts payable, accounts receivable, financial planning, order processing, inventory control and many more.

All are user-friendly. Easily understandable, simple to use — without the need for time-consuming help from your programming staff.

Computer Associates worldwide service capability is always ready to provide any and every assistance our more than 11,000 clients might need.

When you recommend our *Advanced Business Software* to your company, you will be a hero, because our products offer the solid company-wide benefits that really impress top management. Contact us now to arrange a full briefing: Computer Associates, 125 Jericho Tpke. Jericho, New York 11753; 800-645-3003; in New York 516-333-6700.



Business Articles Summarized In Data Base

LOUISVILLE, Ky. — Data Courier, Inc. has announced ABI/Inform, a business data base available to the financial community through Innerline, an electronic management support service which is a co-venture of the American Banker and the Bank Administration Institute.

The data base contains 200-word summaries of articles appearing in more than 590 business and management publications worldwide. Users can do banking-related searches, scan several months of the file on additional topics, such as data processing, marketing, human resources and industries; and order full-text articles of the summaries.

The service price for the data base is \$1.00 per minute connect charge and \$6.50 for each full-text article ordered off-line.

Further information is available from Data Courier, 620 S. Fifth St., Louisville, Ky. 40202.

Inquiry System For Banks Runs On System/34, 36

FRAMINGHAM, Mass. — An on-line inquiry system for consumer bank accounts maintained on IBM's System/34 and System/36 was recently announced by W. A. Wills Associates, Inc.

The Willing system is presently operational on the System/34 and can be readily converted to the System/36, according to a spokesman. It is written in RPG-II.

The system reportedly provides current transaction history since the last statement cycle for loans, savings and various checking and savings accounts such as Now and Super Now accounts, along with automated teller machine transactions.

In addition to daily posting of debit memos and informational messages, the system reportedly calculates daily collected balances, displays daily cumulative interest on Now accounts, reflects payoff amounts on loans and clubs and maintains delinquent history information.

The system is priced at \$20,000 from Wills Associates, which can be reached through P.O. Box 449, Framingham, Mass. 01701.



'Consider It Character Assessment, Higgins — the Computer Is Toying With You.'

'FM/3000' Upgraded for HP Micro Access

BURLINGTON, Mass. — Computer Solutions, Inc. has announced that its FM/3000 line of productivity software has been upgraded to allow access by the Hewlett-Packard Co. Model 150 personal computer acting

as a terminal on the HP 3000 series minicomputers.

According to the company, users of the FM/3000 and FM/3000 Plus software can download data from the mini to the micro for manipulation

or for use in conjunction with application programs currently available for the HP Model 150 personal computer. The FM/3000 and FM/3000 Plus packages include accounts payable and receivable, general ledger and sales order processing.

The package's manufacturing module includes inventory control, purchase order control, materials requirements planning, capacity planning and shop floor control functions. FM/3000 Plus' marketing module — Salespower — is said to provide a data management structure for customer information, sales campaigns and lead and quote activity.

FM/3000 costs \$40,000, and FM/3000 Plus costs \$55,000 from Computer Solutions, One Burlington Woods, Burlington, Mass. 01803.

Connect Charges for 'Delphi' Cut

CAMBRIDGE, Mass. — General Videotex Corp. has implemented a 37% reduction in its daytime connect charges for individual users of the company's Delphi information and communications utility. It has also eliminated the 50% surcharge formerly levied on users communicating at the 1,200 bit/sec rate.

The hourly charge for basic service to individual users not under volume contract has fallen from a

maximum of \$25.50 to \$16. Also, the hourly rate for organizations that have contracted for \$200,000 or more of connect time has been lowered from \$19.50 to \$12.

Delphi is said to enable subscribers to send electronic mail messages and to exchange information via bulletin boards or conferences. It is available for a one-time fee of \$49.95 from General Videotex, 3 Blackstone St., Cambridge, Mass. 02139.



Everything you always wanted to know about mainframes in one little box.

Just when you think you have it all figured out, something new hits the DP world. You can't always hire a consultant to keep pace with new developments, but you can take advantage of Amdahl's industry-leading expertise. Keeping Current — Amdahl's unique video series — is the answer. Keeping Current is the time and money saving way for senior DP staff to obtain a clear and insightful analysis of mainframe problem areas, the latest trends, and future directions in hardware and software. You'll learn how to prevent problems, how to get the most out of your existing system, and shortcuts for daily operations.

Because Keeping Current participants don't

have to fly across the country to seminars, you save big money, and because Keeping Current video presentations fit into normal work schedules, you save valuable time without interrupting the flow. Choose presentations that zero in on MVS/XA, IMS/VS, X.25, CMS/SP, NCP, MVS/SP, ACF/VTAM, or VSAM, and get a new grasp of your operation. First time customers receive the first presentation at half price. So don't wait. It's amazing how much there is to learn about mainframes. Start Keeping Current today.

For more information, call Amdahl Education at 800-538-8460 ext. 6393. Within California call (408) 746-6393.

the amdahl phenomenon

In October, 1970, a company was formed expressly to build one product: A mainframe computer that would outperform the mainframe that owned the market at that time. Today, this company is an international success story, a phenomenon.

Engineering Data Base Out, Provides Microfiche Files

DENVER — An engineering data base providing regularly updated microfiche files has been announced by Inacom International.

Tech-Doc reportedly contains information on more than 400,000 industrial products and is updated every 60 days. Also announced was Micro-Index, a microcomputer-based indexing program providing access to the location of data stored on the data base.

Information contained in Tech-Doc files and Micro-Index is divided into 18 categories: electronic components; electrical components; computers; communications equipment; instruments/controls; motors/en-

gines/turbines; compressors/blowers/fans; mechanical components; fasteners; fluid system components; metallic materials; nonmetallic materials; plastics/resins/elastomers/rubbers; adhesives/sealants; lubricants; surface treatments; chemicals; and services.

Subscribers can order all 18 files for \$4,500 a year or tailor the subscription to meet their needs. Micro-Index is provided on hard disks or floppy disks at 57% of the Tech-Doc subscription price for use with microcomputers using Microsoft, Inc.'s MS-DOS operating system. Inacom is located at 4380 S. Syracuse St., Denver, Colo. 80237.

Mumps Users Publish Primer

COLLEGE PARK, Md. — The Mumps Users Group has published the 122-page "Mumps Primer: An Introduction to the Interactive Programming Language of the Future."

The primer features 19 chapters with examples that introduce the reader to increasingly sophisticated principles and applications. Early segments focus on developing an understanding of how Mumps differs from Fortran and Cobol, and later chapters explore the language's ability to manipulate textual strings, plus a feature called "indirection" that permits the dynamic creation of executable code.

The primer covers concepts relating to operations on numeric values and operations on strings and commands before advancing to specific

Mumps capabilities, such as the ability to create global variables and the use of string subscripts.

The primer is available for \$12, plus \$1.50 for shipping from the Mumps Users Group, Suite 308, 4321 Hartwick Road, College Park, Md. 20740.

Design Package Debuts for Use With DEC RSTS

FREDERICTON, N.B. — Solutions Deck, Inc. has announced the SD Design software package for use in the Digital Equipment Corp. RSTS operating system environment.

According to the vendor, the package provides a method to design and document proposed new programs or changes to programs. It is said to allow programming in English via a terminal, and it can produce program narratives, screen or report layouts and suggested program outlines to the code section level which can serve as coding guides.

The SD Design package reportedly also features an option to cross-reference and classify usage of all data names. Screen and report layouts, along with the master and transaction program narratives, can be used to produce a static prototype of the proposed system. It is said to be a subset of the company's Solutions Deck series of productivity tools.

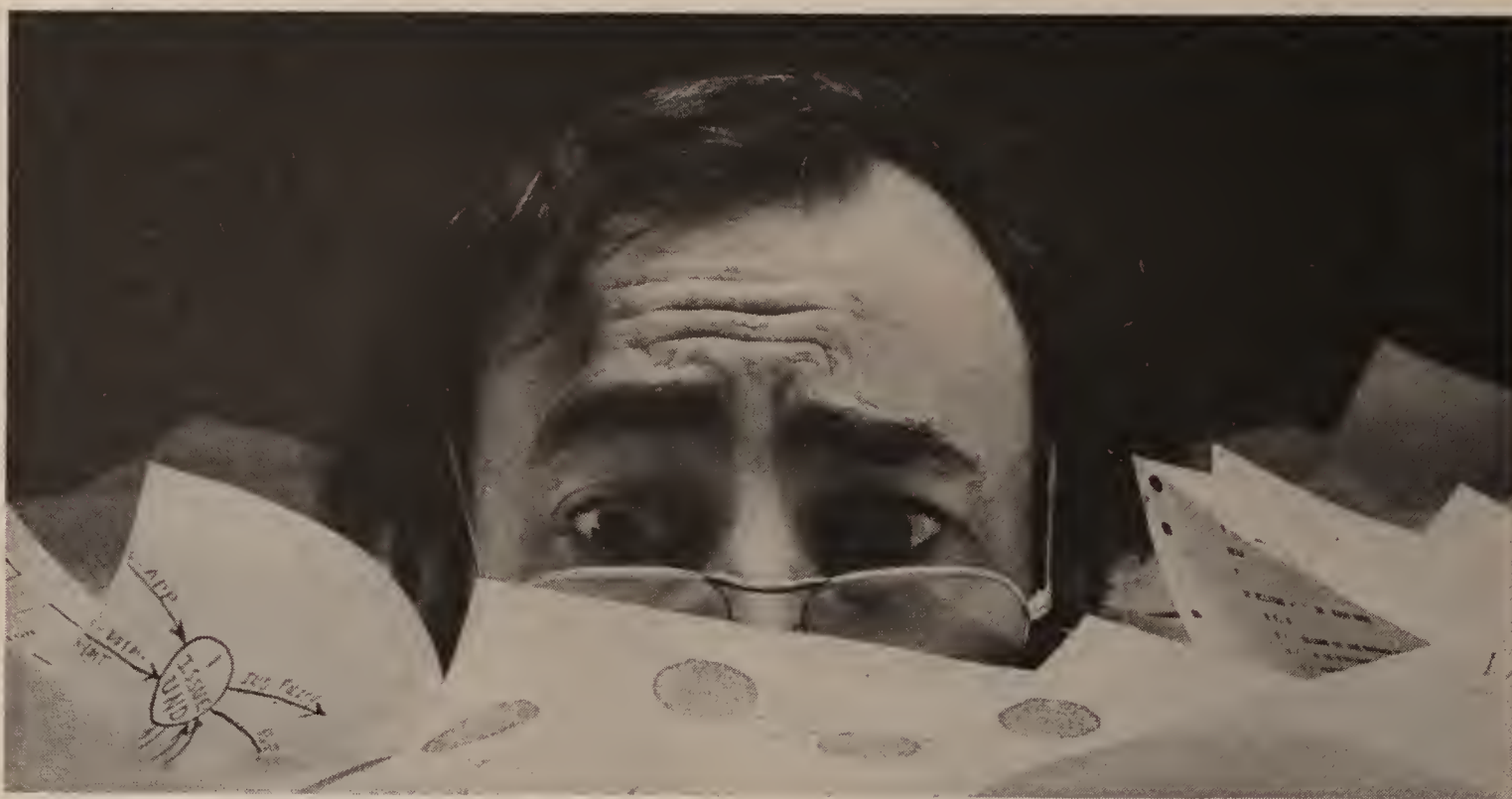
SD Design is priced at \$795 from Solutions Deck, P.O. Box 684, Postal Station A, Fredericton, N. B., Canada E3B5B4.

DBMS Update Announced For DEC Users

CAMBRIDGE, Mass. — Software House, Inc. has announced Version 116 of its System 1022 data base management system for users of Digital Equipment Corp. mainframes.

Enhancements include two features to integrate separate data files. A COLLECT command gathers any number of files of the same type to appear as one large data set. A Join operator links dissimilar file types across common field values, a spokesman said.

A typical license costs \$32,500 for the Decsystem-2060. Software House is located at 1105 Massachusetts Ave., Cambridge, Mass. 02138.



A little couponwork takes the endless paperwork out of data base design.

People involved in data base design have had good reason to be frustrated: They've had to endure a maze of endless paperwork and manual procedures so that others may escape it.

MANAGER SOFTWARE PRODUCTS' DESIGNMANAGER™ provides them with a method of carrying out data analysis and data base design quickly and cost-effectively — without endless paperwork.

DESIGNMANAGER's central driving force is a modeling dictionary that holds information about your organization's data resource. The content of the modeling dictionary is interactively built up by end-users and analysts directly through two complementary methodologies: top-down (Enterprise model) and bottom-up (userview model).

The reconciliation of these two components provides the basis upon which you can construct and verify models of your organization's data, and generate stable, third-normal form logical data base designs.

DESIGNMANAGER can increase user productivity whether used as a stand-alone system or fully integrated with other dictionary-driven products in MSP's MANAGER family. These include DATAMANAGER™, the data and information resource management system, and SOURCEMANAGER™, the COBOL application development system.

Find out how DESIGNMANAGER can take the endless paperwork out of your data base design work and increase productivity. Send the coupon today. Or call (617) 863-5800 (Telex 710 326 6431).

msp

MANAGER SOFTWARE PRODUCTS INC

Offices worldwide: Australasia, Benelux, Canada, Italy, Japan, Scandinavia, Spain, Switzerland/Austria, U.K./Eire, U.S.A., West Germany.

Send me more information about MANAGER SOFTWARE PRODUCTS' family of integrated, dictionary-driven products:

☐ DESIGNMANAGER ☐ DATAMANAGER
☐ SOURCEMANAGER

Name _____ Title _____

Company _____

Address _____

City/State/ZIP Code _____

Telephone Number (_____) _____

Send coupon to MANAGER SOFTWARE PRODUCTS INC,
131 Hartwell Ave., Lexington, MA 02173.
Or call (617) 863-5800. Telex 710 326 6431

CW 11/14



'Professor Simpson Is Double-Checking His Figures at the Moment, Sir.'

Due to popular demand, we've created a new display that fits both tight spaces and tight budgets.

Our new ITT Courier 1700.

The 1700 is compatible with the 3278 model 2. Yet its footprint is only 13 x 12 inches (24% smaller than IBM's 3178). And its keyboard is only 16 inches wide (17.9% smaller than the 3178).

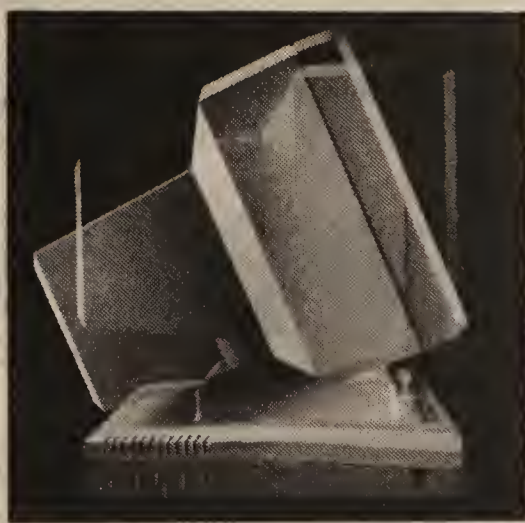
Still, the 1700 is big on

ergonomics and the kind of performance features you expect from ITT.

Its screen tilts and swivels, and its keyboard adjusts for optimum operator comfort.

It has Reveal to aid program development. Capture to aid troubleshooting. And Variable Field Underline to increase productivity.

Things you don't get with the IBM 3178.



ITT 1700 tilts, swivels and has a smaller price than IBM 3178.

Even with all this, the ITT 1700 is priced lower than IBM's 3178.

The ITT Courier 1700. The economy-sized 3270 display that really is economical.

Contact the ITT Courier Sales Support Department, 1-800-528-1400 Ext. 7796. 1515 W. 14th Street, Tempe, Arizona 85281

ITT
COURIER

WE HAVE 3270 COMPATIBILITY IN THE NEW ECONOMY SIZE.

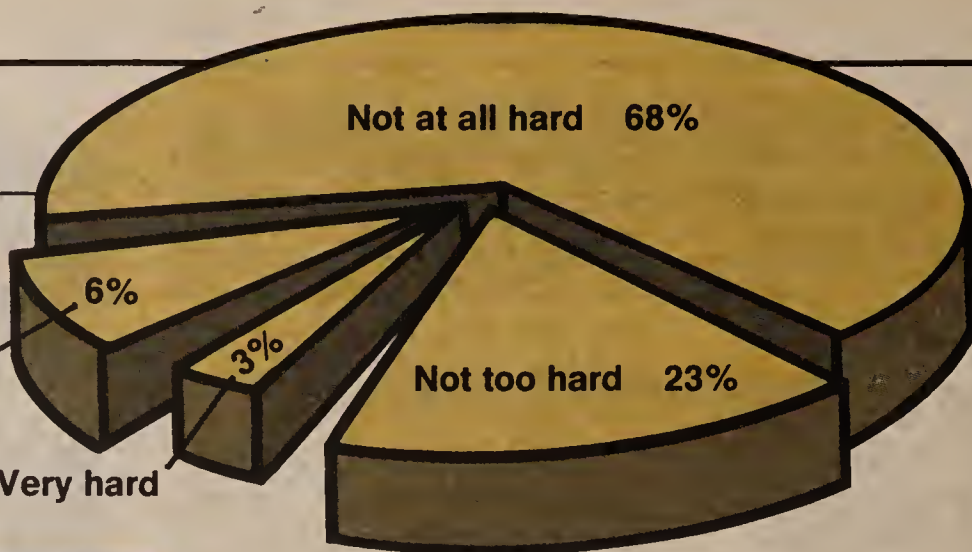


ITT Courier 1700.

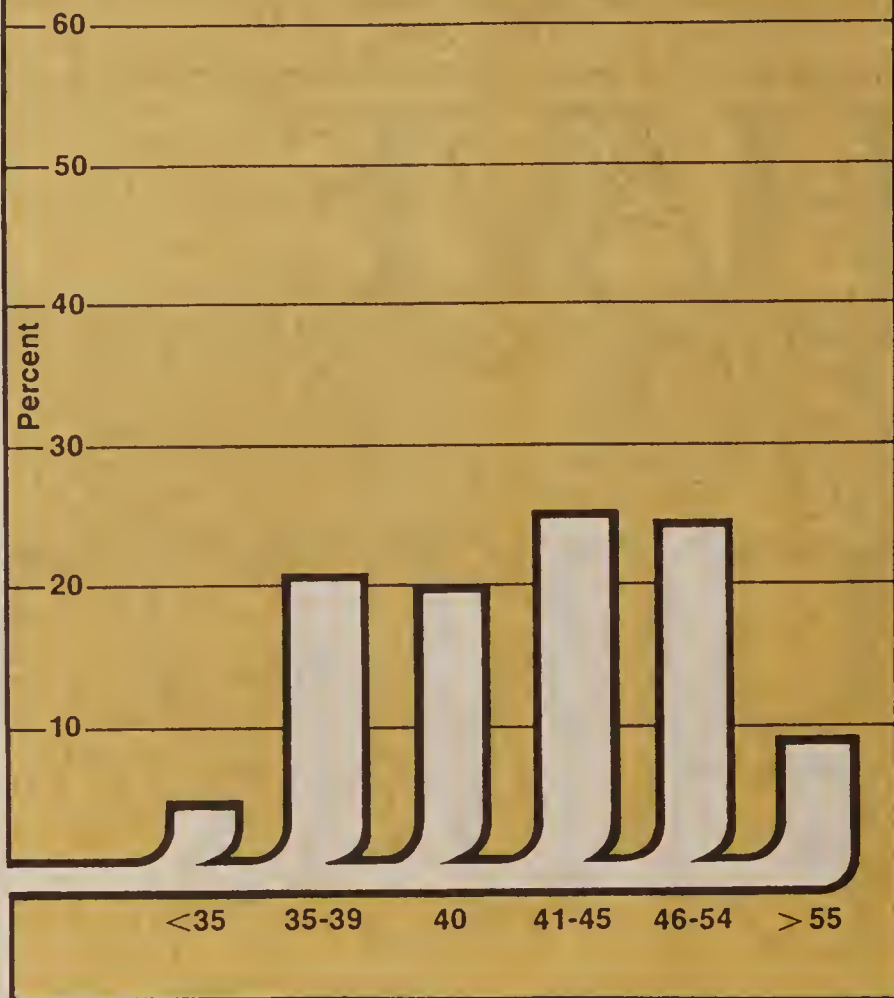
How hard is it to take time off?

Somewhat hard

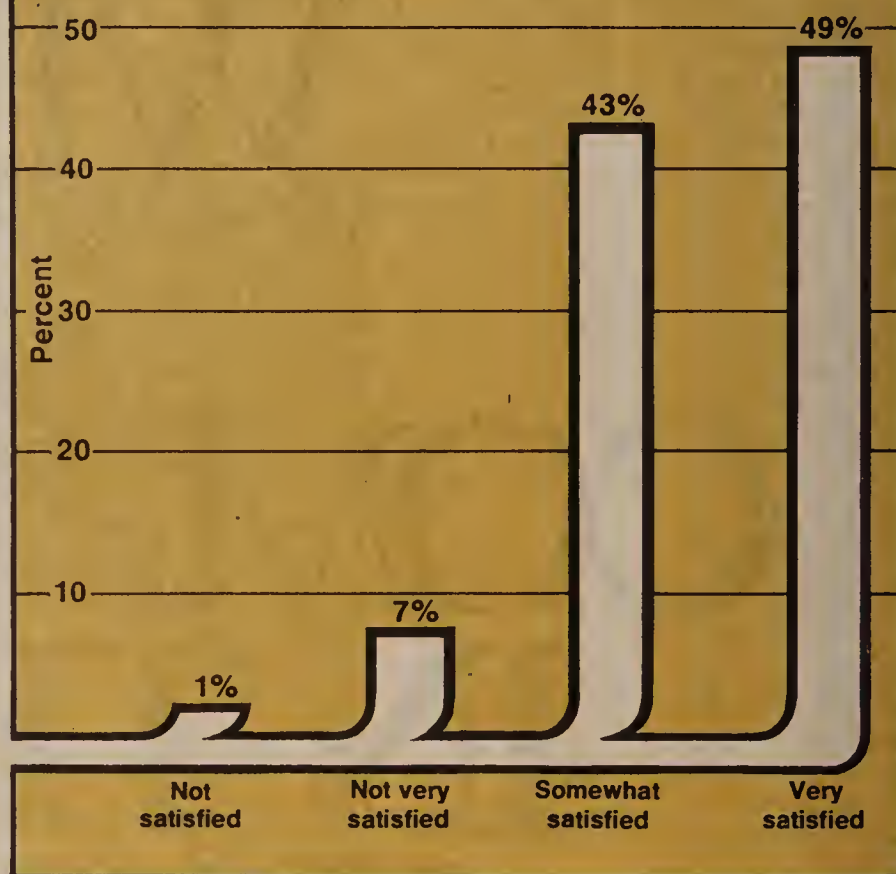
Very hard



How many hours a week do you work?

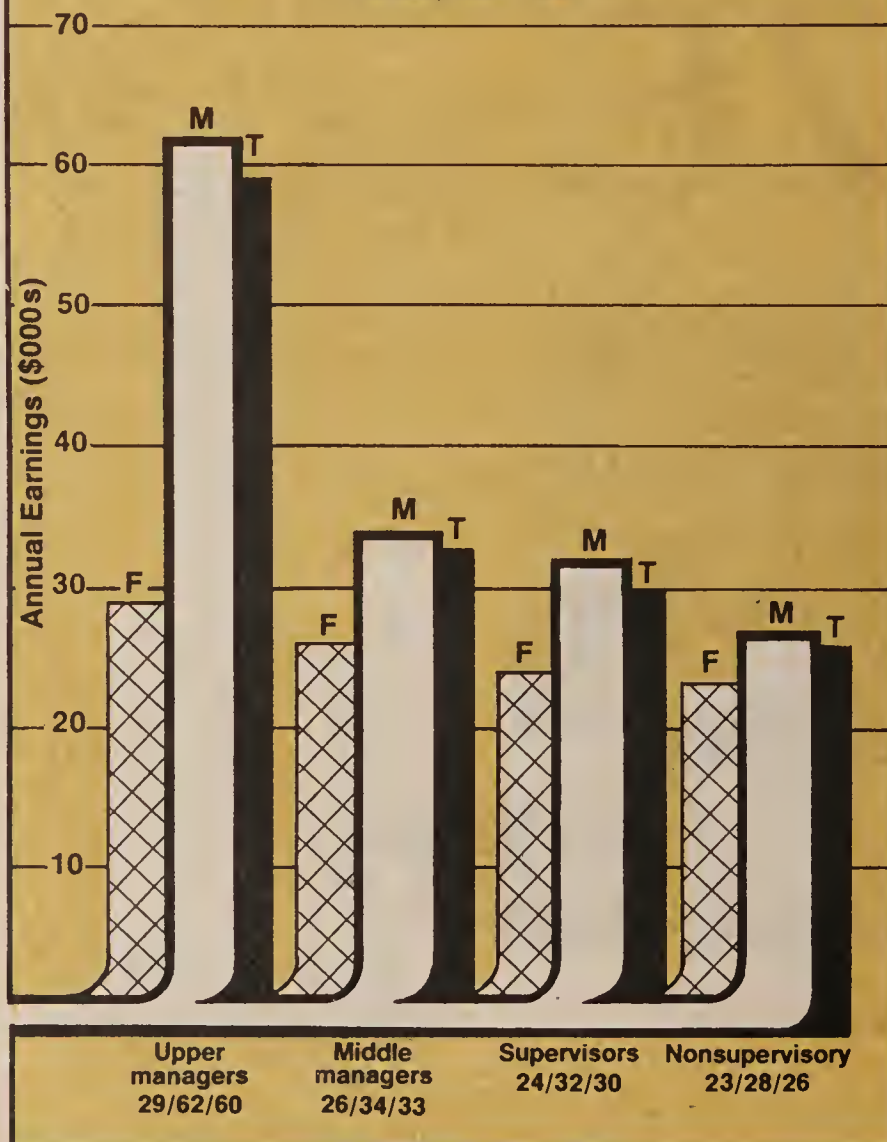


How satisfied are you with your job?

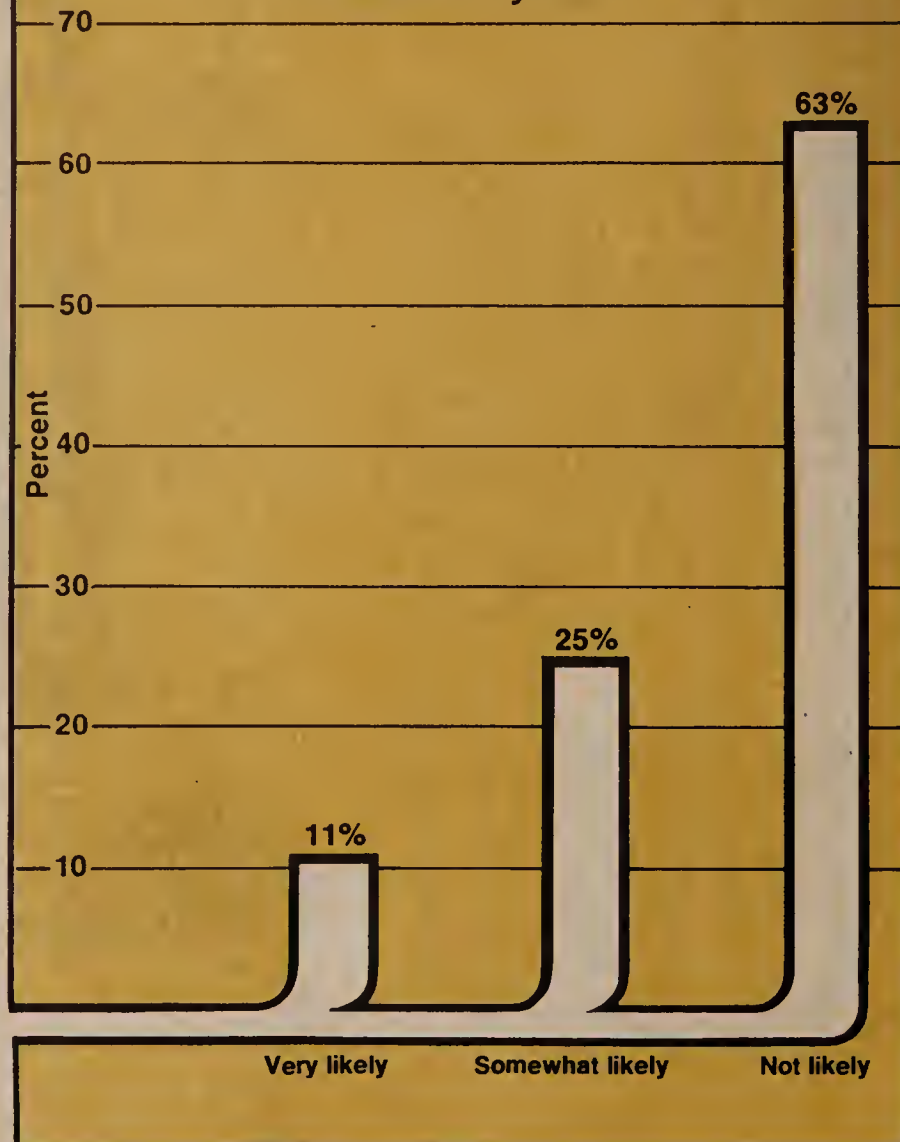


What are your annual earnings?

Female/Male/Total



Will you try to find a new job in the next year?



Software Workers Survey

By Philip Kraft
and Steven Dubnoff

Ninety percent of U.S. software specialists express a high level of job satisfaction, yet more than a third of them intend to look for another job within a year.

Of the high-tech fields, software work is the most open to women, yet their status in this area is that of second-class citizens. Furthermore, their situation may get worse before — and if — it gets better.

There is a frustrating lack of information about the software work force. In an attempt to build a worker profile, we recently conducted a two-year survey of 677 software specialists. We believe this study is the first of its kind based on a comprehensive probability sample. Completed in 1982, it confirmed some widely held beliefs about software work and raised doubts about others.

One of our intentions was to collect the standard demographic and attitudinal data that is available for most other occupations. Data collected by the Bureau of Labor Statistics and the Census Bureau offers a skeletal picture, at best, of the software field. Industry and academic studies of software specialists have been based on convenience samples that are not representative of the general software work force. For example, membership in professional societies is confined almost exclusively to academics and managers. Most software specialists would therefore not appear in a sample drawn from membership lists of those organizations.

By contrast, our study was based on a sample of software specialists of all kinds, drawn from the general population and stratified by age and gender (see box on In Depth/4). It is thus much more representative of the software work force as a whole.

The typical software specialist is male, age 32 (=median, mean=34, mode=29), white and employed by someone else. The average programmer has completed 16 years of school. Five percent have only a high-school degree or less, 80% college degrees, 24% master's degrees and 4% Ph.D.s or the equivalent.

Software workers are almost exclusively white. Only 5% are not, and of this group, a majority are Orientals. Women make up 24% of the work force. By contrast, in 1980 the employed U.S. work force as a whole was 11.2% black and 42.4% female.

A majority of respondents said they routinely worked more than 42 hours a week. Although a substantial majority began work at the same time every day, nearly one-fifth said they varied their starting times and 44% said they did not work the same number of hours every day.

Whoever said "IBM isn't the competition, it's the environment" knew what he was talking about. Thirty-five percent of our sample used IBM operating systems — although not all used them on IBM machines. Cobol, assembler and Fortran were the three most widely used languages, in that order, accounting for 53% of the primary languages used. Interestingly, 6.5% of our respondents reported they did no programming at all.

In terms of hardware, it might be said that IBM came in a strong first and Digital Equipment Corp. a weak second, (Continued on In Depth/5)

IN DEPTH

Drawing a Representative Sample

Our sample was drawn from the "street lists" of the cities and towns of the Boston Standard Metropolitan Statistical Area. These lists are a unique resource in that they contain the names, ages, addresses and occupations of all inhabitants over the age of 17. They therefore allow us to construct probability samples of rare occupational groups such as software specialists.

Software specialists were sampled from the lists at varying rates based on age, sex and occupational title.

The goal was to produce a sample with approximately equal numbers of men and women, equally distributed by age.

Women represent about a quarter of the software work force. We oversampled women in order to obtain a statistically valid population of female specialists. The numbers of male and female specialists are proportionately weighted in arriving at the accompanying analysis.

Because each of our respondents was sampled with a known

probability, we have been able to weight our sample to represent accurately the population from which it was drawn. At the same time, we have been able to analyze the characteristics of such rare populations as older female programmers.

Our sampling was inclusive in that we wanted to give every member of our target population a chance to be in the sample. Respondents determined their eligibility based on a series of screening questions which, at their base, sought to determine whether the potential respondent was employed in a job that "involved the design, production or maintenance of computer software."

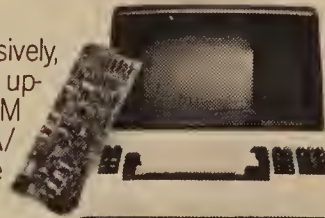
We are confident that our sample adequately represents the population of software specialists in the Boston area. We believe it is also broadly representative of the working conditions, if not the industrial distributions, of software specialists elsewhere in the U.S.

The study was supported by the National Institute of Mental Health.

Let Control Concepts board up your Beehive.

Easily and inexpensively, Control Concepts can upgrade your Beehive DM 3270 terminal to SNA/SDLC with the simple installation of our SDLC Circuit Board.

Call us, or send in the coupon and let Control Concepts show you how to keep your Beehive busy — at about one third the cost of a new system. Call toll free, **1-800-368-3078**. In Virginia call 1-703-631-0435.



☐ I'd like to know more about upgrading to SNA/SDLC.

Name _____

Title _____

Company _____

Street _____

City _____ State _____ Zip _____

Telephone _____

CONTROL CONCEPTS

P.O. Box 2367, 12004 Ballsford Rd.
Manassas, VA 22110

IMPROVES RESPONSE TIME FOR REMOTE USERS!

Follow The Lead Of Leaders Such As RCA Corporation.

**New Speed!
New Efficiency! And it
reduces the need to
add new hardware!**

Performance? You Bet!

- Instantly improves CRT response time.
- Improves CICS/printer speed.
- Reduces line busy and front end loads.
- Gives new life to slower circuits.
- Simplest product you will ever install.

**Here's Two Good
Reasons Why You
Should Call Today:**

- CTOP® is site licensed at \$2,500.
- Free trial before you buy.

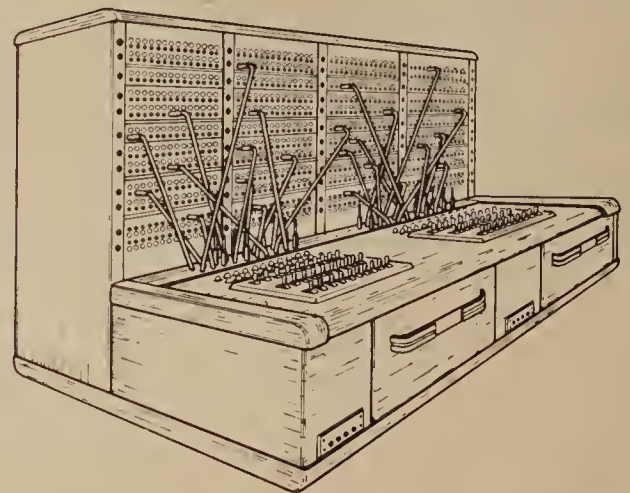
**CALL:
(208) 377-0336**

H&W
COMPUTER SYSTEMS, INC.

H&W Computer Systems, Inc., P.O. Box 4173, Boise, Idaho 83711

CICS Solutions

IMPROVE YOUR COMMUNICATIONS



WITH CECOM MICRO & MAINFRAME FILE SHARING!

With the help of Cecom, your people can upload and download data as well as share files with the IBM mainframe and other PCs and still maintain data integrity and total system security. Supporting recognized 3278 emulation cards and protocol converters, the easy to install Tempus-Link creates a flexible environment where your users can connect to on-line applications.

Running under all recognized IBM

software disciplines for the PC, the PC-XT, and mainframes, the Tempus-Link also enhances your communications while giving you complete interaction and integration with the micros in your organization.

For more information about the Tempus-Link, assorted emulation cards, total system or network configurations, or equipment refurbishing, call or write:

3798 Williston Road
Minnetonka,
Minnesota 55343

cecom
cecom, incorporated

We Communicate!

Call Collect:
(612) 938-7178
(201) 244-1550
Dealer inquiries invited.

IBM, PC, and PC-XT are trademarks of International Business Machines. Tempus-Link is a trademark of Micro Tempus, Inc.

(Continued from In Depth/3) while everyone else competed for last place. In fact, our miscellaneous catch-all category of "other hardware" came in third, beating all other manufacturers.

In 1981, the mean annual earnings of software specialists exceeded \$31,000. The figure is a bit misleading, however, because managers as a group earn considerably more than nonmanagers. When managers and supervisors are excluded, the average annual earnings figure is a more modest \$26,300.

Upper-level managers do very well indeed. The mean annual job earnings of upper-level managers are \$62,000. For middle managers, the figure is \$34,000 and for low-level supervisors, \$32,000.

Job Satisfaction

On the surface, job satisfaction is high. Ninety-two percent of our respondents said they were either somewhat or very satisfied with their jobs. There was no overall difference in job satisfaction between men and women.

Among men, but not women, there is a small and statistically weak association between job satisfaction and satisfaction with pay. In fact, what is significant is the lack of a strong association between pay and job satisfaction. This finding is consistent with studies of other occupations, which show that the nature of the job and on-the-job personal relations are more important than pay in predicting overall job satisfaction.

Although the 92% satisfac-

tion level appears high, American workers in virtually all occupations consistently report high levels of job satisfaction. An earlier study conducted by the University of Michigan showed that job satisfaction for the U.S. work force as a whole was about

the same as that of the programmers in our sample.

A better indicator of job satisfaction is whether employees intend to change jobs in the near future. Thirty-six percent of the software specialists in our sample said they were somewhat or very

likely to look for another job in the next year. Most of those who said they were expecting to look for another job indicated they would look for a different job in the same field, indicating dissatisfaction more with their current job than with the

software field in general.

Another and related indicator of job satisfaction is whether someone is willing to recommend the same kind of job to a close friend. Overall, 79% of our sample said they would recommend their job to a friend, while 21%



Computer Interruptus

ALUMINUM MAG TAPE REEL CASES

ships up to 18 reels
in strong lightweight case



#5125
1 to 10 Canisters
#5126
1 to 14 Thinline
#5127
1 to 18 Tape seal



#5110
1 to 5 Canisters
#5115
1 to 7 Thinline
#5120
1 to 9 Tape seal

See your local dealer, or call/write -

ALUMINUM CASE CO.
DIVISION OF BY-LO MFG., INC.

3333 W. 48th PL. CHICAGO 60632 (312) 247-4611

Midnight. And you wish you would be left in the dark. But miles away in the DP Department, a misplaced DD override, an invalid concatenation, or some other equally obscure JCL error brought production to a standstill.

And when the system breaks down, it's you or your staff they call up. Which usually means getting up and getting down there. And after a night like that, how productive will the morning be?

What a waste. If you had the JCLCHECK™ program, you wouldn't have JCL errors, period. None. Zilch. Zero.

Because the JCLCHECK program can catch any and all JCL errors and give you complete, on-line JCL valida-

tion and concise error diagnostics. Plus complete documentation on a job stream or entire production system suitable for insertion in the run book. And it can operate under TSO, TONE, ROSCOE or CMS.

Imagine, with no more JCL errors, your programmers can finally concentrate on what you hired them for: writing programs.

So what are you waiting for? Send the coupon or call us at (408) 554-8121 for details. We'll show you how the JCLCHECK program can bring your error detection out of the dark ages, increase production, and eliminate applications backlog. And that'll put you in the spotlight.

I'm frustrated and tired of JCL errors.
☐ Send me details on the JCLCHECK program.
☐ Have a representative call me.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY, STATE, ZIP _____
PHONE _____
OPERATING SYSTEM _____



Triangle Software Company

4340 Stevens Creek Blvd., Suite 108
San Jose, CA 95129

IN DEPTH

said they would advise against it or had doubts about doing so. Although somewhat less positive than the response to the question "How satisfied are you with your job?" these figures still indicate a relatively high level of job satisfaction.

The responses changed significantly when we asked our respondents whether they found their managers technically capable and helpful with respect to personal problems that affected the respondents' work. Of those who said their managers

were technically capable, 90% said they would advise a friend to take a similar job. Seventy-four percent of those who felt their managers were not technically capable would recommend their job to a good friend.

Similarly, 91% of those

specialists who felt their managers were helpful with personal problems that affected their work would recommend their job to a good friend. For specialists whose managers were not helpful with personal problems, 68% would recommend their job.

In short, pay seems relatively unimportant in predicting job satisfaction, at least when we ask the straightforward question, "How satisfied are you with your job?" However, if we use the job-recommendation question as an indicator of job satisfaction, competent and supportive managers emerge as statistically reliable predictors of job satisfaction. In other words, managers who have the respect and trust of their staff are more important than money to programmer job satisfaction.

Equal Opportunity

The extremely low number of American blacks in software jobs is astounding. We have no systematic explanation for this situation and intend to explore the matter in future studies. For whatever reason, the employment opportunities offered by this prototypical high-tech industry seem to have completely bypassed black Americans.

The situation of women is more complex. Our study confirms a widely held perception that women have established a significant presence in software work: 24% of the software work force is female. To put this figure in perspective, consider that the percentage of women in electrical engineering has recently doubled — to 2%. In addition, women software specialists are represented among managerial ranks in proportion to their overall numbers: 22% of the women in our sample were managers of one kind or another.

Software jobs promise to remain open to women. About equal numbers of women and men entered the field in the two years immediately preceding our study, 1980-1981. Furthermore, in terms of people currently in the occupation, a higher proportion of women than men entered the occupation during the previous five years.

In fact, software work is the most open to women of the technical-scientific fields. One has to look to the traditional so-called female professions — teaching, library work, counseling, nursing and so on — before finding any professional occupation with as high a percentage of women.

In 1981, the mean earnings of women software specialists were 70% of men's. Even when we control for background characteristics other than gender (years in



Keeping Formica Corporation On Top



"The integrity of Formica Corporation is very important to me. When we promise rapid delivery, we mean it," reports Gordon Sterling, President.

"American Software's Sales Forecasting system helps us keep our promises and maintain a high level of customer service by more effectively managing our inventories. Our investment in American Software's Sales Forecasting system has more than paid for itself... and I look forward to even more savings in the future."

American Software can provide you with proprietary software packages for Sales Forecasting, Purchasing, Inventory, Manufacturing, and Materials Management. Plus extensive consulting help, and the training you need for successful implementation.

American Software. The Power of The Right Decision.



443 E. Paces Ferry Rd., Atlanta, GA 30305 (404) 261-4381

IN DEPTH

In terms of earnings, women are better off in large organizations. Pay discrepancies are greatest in small organizations (less than 100 employees), where women earn barely half of what men earn.

software work, weeks and hours worked and years of education), the figure rises only to 85%.

In terms of earnings, women are better off in large organizations. Pay discrepancies are greatest in small organizations (less than 100 employees), where women earn barely half of what men earn. Pay discrepancies are smallest in large organizations (more than 499 employees), where women earn 79% of male wages (percentages not controlled for background characteristics here).

There are several possible explanations for the variation. The most likely is that federal and state equal opportunity and antidiscrimination regulations apply primarily to large organizations.

These discrepancies are smaller than the male/female wage difference in the U.S. work force as a whole, in which women earn 59 cents for every dollar earned by men.

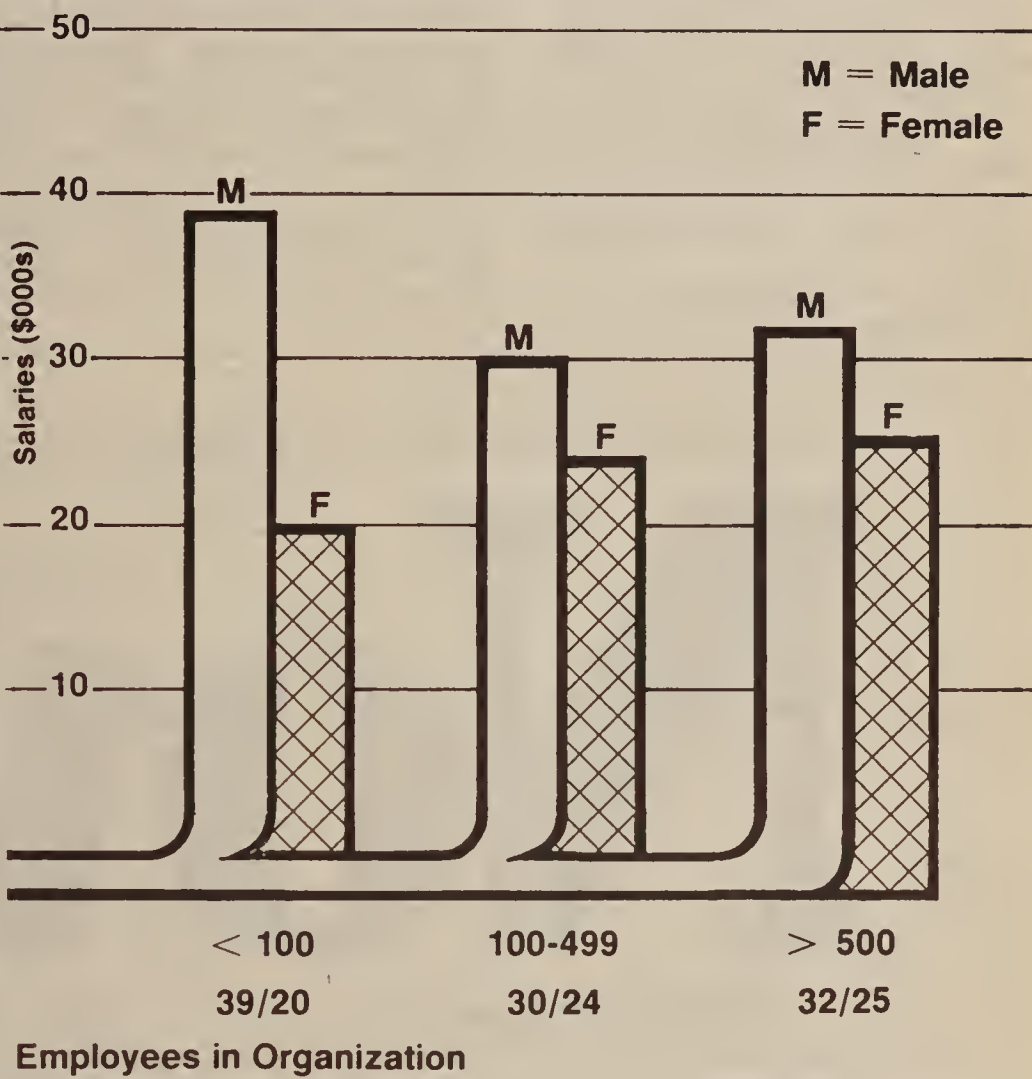
But the earnings gap between men and women software specialists hardly suggests a field free of pay discrimination. To put a dollar value on pay discrimination, on average it is a \$5,000 per year liability to be a woman in software.

In a similar vein, men are three times more likely to be upper-level managers than women (10% vs. 3%). And probably just as significant, women who supervise software specialists are likely to supervise other women, while men are likely to supervise other men. Men managing men and women managing women is a familiar scene in the business world.

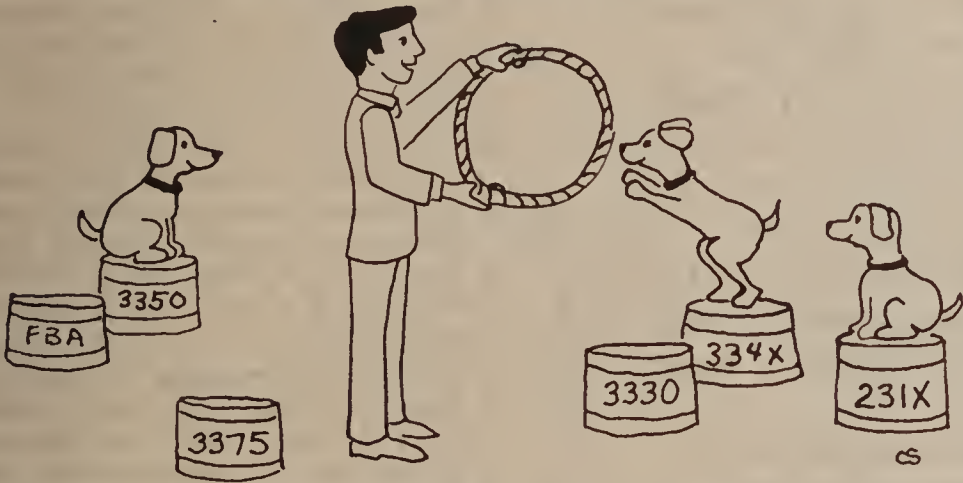
The status of managers reflects the status of the people they manage. Our society defines women as low status workers. We would, therefore, expect that women would be managed by other women.

Finally, although few women in

Annual Earnings by Size of Establishment



Teach Old Programs
New Tricks



If you have some old dogs lying around – either programs or DASD – call us and we'll show you how to teach them new tricks that will amaze you.

SDI's Universal Disk Compatibility System can now allow you to place *any* access method on *any* disk type with no changes to program or JCL even if the source code is missing:

For a free information kit describing UNIVERSAL DISK COMPATIBILITY, contact the SDI office nearest you:

New Jersey
(201) 569-7212

Texas
(214) 241-8730

Minnesota
(612) 835-6822

California
(415) 572-1200

SDI Since 1968, making computers
a manageable resource

UNIVERSITY OF PETROLEUM & MINERALS
DHAHRAN — SAUDI ARABIA

COMPUTER SCIENCE AND ENGINEERING DEPARTMENT

The Department of Computer Science and Engineering will have faculty positions in Computer Science and Engineering open for the Academic Year 1984-85, starting 1 September 1984.

ACADEMIC QUALIFICATIONS AND EXPERIENCE:

Ph.D. in Computer Science or Computer Engineering or in a closely related discipline with emphasis in programming languages, Data Base-Organization and Structure, Microprocessors, Operating Systems, Data Processing, System Analysis, Digital Design, Computer Architecture, Software Engineering, Micro-Electronics and Robotics.

The Department offers an undergraduate program in Computer Science and Engineering and a Master program in Computer Sciences.

Computing facilities available include a Computer-Aided-Instruction Center based on an HP-3000 and a number of Micro-Computers, a Computer-Graphics Center with a VAX 11/158, 11/780 and a number of work stations in addition to an IBM 360/158, IBM 3033 and various minicomputers and microcomputers.

Language of instruction is English.

Minimum regular contract for two years, renewable. Competitive salaries and allowances. Air conditioned and furnished housing provided. Free air transportation to and from Dhahran each year. Attractive Educational Assistance Grants for school age dependent children. All earned income without Saudi taxes. Ten months duty each year with two months vacation with salary. There is also possibility of selection for the University's on-going Summer Program with good additional compensation.

Apply before 30 January 1984 with complete resume on academic, professional and personal data, list of references, publications and research details, and with copies of transcripts and degrees, including home and office addresses and telephone numbers to:

University of Petroleum & Minerals
Houston Office (Dept. 163)
5718 Westheimer, Suite 1550
Houston, TX 77057



IN DEPTH

our sample reported that they had experienced job or pay discrimination on the basis of sex, 35% of the women (vs. 19% of the men) said they expected to encounter sex discrimination in the future. Discrimination on the basis of age was also a concern to a minority of both men and women.

We take these anxieties to be an indicator of the type of experiences women software workers have had after working at least a year in the field.

The extent and depth of the pay

Ironically, in a field that symbolizes the glamour and earnings potential of specialized high-tech skills, the key to financial success in software is not to specialize and not to get too technical. People with the highest paying software jobs spent only modest amounts of their time on technical matters.

differences — particularly at the management level — are much greater than indicated here. They will be examined in more detail later.

We were especially interested in the relationship between time spent on particular job tasks and total job earnings. Here, too, there were some

contradictory findings. Ironically, in a field that symbolizes the glamour and earnings potential of specialized high-tech skills, the key to financial success in software is not to specialize and not to get too technical. People with the highest paying software jobs spent only modest amounts of their time on technical matters, such as designing specifications for software systems. Similarly, they spent some but not a lot of their time supervising others.

The best paid people spent most of their time making general decisions involving software and hardware purchases, planning the direction of their department or organization and carrying out other — and largely traditional — managerial roles.

In short, in spite of the talk about the financial rewards available to scarce technical specialists, in software work, as in the rest of the corporate world, the rewards go to managers, not to technicians, engineers or scientists. With respect to gender, if generalists are rewarded with higher pay than technical specialists, then the generalists tend to be men while the specialists tend to be women. In programming, we have not found any evidence of a strong relationship between technical skill and high pay.

Women, Pay and Middle Managers

In terms of demographic characteristics, education and pay, software workers resemble specialists in other technical and engineering fields.

Yet our study also reveals important changes in the organization of software work. These changes promise to have a great affect on entry into the field, the role of women and long-term career prospects, particularly for middle managers.

Polarization. The first of these changes is the clear-cut polarization of software work into distinct specializations. By this term we mean more than the traditional divisions by industry or field, that is, business programming or systems analysis. We also find emerging divisions between analytic work and routine work, between work that involves decision-making responsibility and work in which most decisions are made by someone else.

We asked our 677 respondents to tell us how much time they spent on a variety of job tasks typically performed by software specialists. The tasks ranged from documenting one's own code to specifying the requirements of a software system to planning the direction of the respondent's department or organization.

When we clustered the tasks performed by the respondents, we discovered divisions that are essentially between managers and managed. Software is now characterized by a thoroughly conventional organizational structure in which some people do the thinking and other people do the work.

The old system — in which the specification, design, production, testing and installation of a whole

If you're looking for the best word processing for your DEC PRO, it's here.

Now!

For over five years, DEC™ users at over 1400 sites have been running WORD-11™ on PDP-11™ and VAX™ computers. Because it's the most powerful word processing package for DEC systems. It solves their office automation needs. And it's so thoroughly tested, so well thought-out, and so completely debugged, they would never think of using anything else.

And now WORD-11 is available for DEC Professional 350 users, too. Based on the popular PDP-11 and VAX versions, WORD-11 provides full function word processing. You can interactively create, edit, and print a wide variety of documents ranging from letters and reports to contracts and technical manuals.

In addition, all documents created using WORD-11 on the PRO-350 are compatible with WORD-11 files created on other DEC machines, even though they use different operating systems. And, above all, WORD-11 is the easiest word processing package to learn and use today.

It's just as easy to own, too. In fact, if you purchase WORD-11 for the PRO 350 during DEXPO, and the sale is completed in less than 45 days, you can take it home for only \$595. That's a discount of 25%. And it's good on any quantity you purchase.

But you'd better hurry. Other people are reading this ad.



See us at Booth #906.

Data Processing Design, Inc.

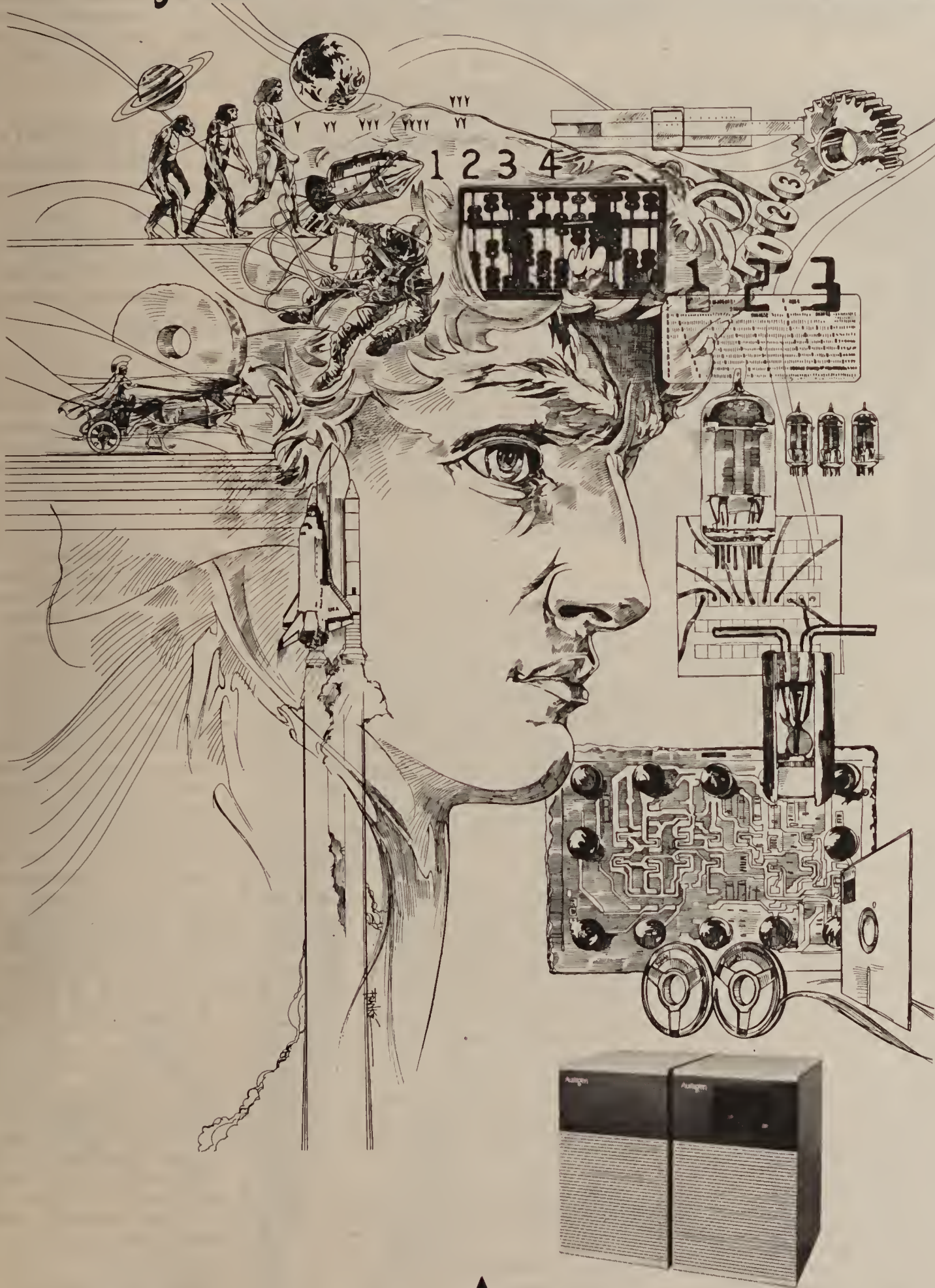
AUTHORIZED digital COMPUTER DISTRIBUTOR

CORPORATE OFFICE, 1400 No. Brasher, Anaheim, CA 92807 (714) 970-1515
N.Y. OFFICE, 420 Lexington Avenue, Suite 633, New York, NY 10170 (212) 687-0104
WASHINGTON D.C. OFFICE, 4520 East-West Highway, Suite 550, Bethesda, MD 20814 (301) 657-4098

WORD-11 is a trademark of Data Processing Design, Inc.
DEC, PDP-11, VAX, and PRO-350 are trademarks of Digital Equipment Corporation.

How to be a more competitive OEM: Start at the Auragen.[®]

The optimum package of performance,
fault tolerance, expandability and flexibility to make
you fit for survival in the harshest climates.



Now, you can start in front of the competition with an AURAGEN 32-bit superminicomputer that will run existing applications fully fault tolerant without modification.

Unique, Transparent Fault Tolerance

You can offer a high performance fault tolerant system that is UNIX[™] compatible. AUROS[™], the AURAGEN operating system provides automatic fault tolerance, transaction processing, security and recovery capabilities. AURAGEN backup hardware does productive work during normal operations. Result: no downtime, no special programming, no manual backup procedures, no added expense for nonproductive backup hardware.

Unsurpassed Price Performance

An entry level AURAGEN system delivers the performance of a VAX 780[™] at an entry price of \$68,000, quantity 1. Substantial quantity discounts are available to qualified OEMs.

Protect Software Investment Through Hardware Expandability

The AURAGEN System was designed to allow your applications to grow without reprogramming as your customers expand their System 4000 from supermini to mainframe capacity. The basic processing unit of an AURAGEN System is a cluster of tightly coupled MC68000 microprocessor modules. As your customers' requirements continue to grow, you can expand the system on-line from 1 to 32 clusters. Our modularity allows the System 4000 to grow in precisely controlled increments.

Configuration Flexibility To Match Your Requirements

AURAGEN's modular design provides the flexibility needed to meet different processing requirements. If you have special requirements AURAGEN will tailor a system to match your application.

Higher Programmer Productivity

Everything in the AURAGEN System helps programmers achieve maximum productivity. Our programming languages include ANSI 74 High Level COBOL, Fortran 77, Pascal, C, and Basic. We offer a full-function relational DBMS and Transaction Processing Management System, as well as menus and help facilities. Our extensive communications packages include Async, Bisync, HDLC, X.25, SDLC, SNA, IEEE 802 LAN, and AURANET[™], our TCP/IP based private network.

The AURAGEN 4000 is built for the real world that OEMs must compete in: a world with rapidly changing processing requirements, fewer senior programmers, ever increasing demands for user-friendliness, where fault tolerance is quickly becoming the rule, not the exception.

For the full story on how to get the competitive edge, write or call today: **800 221-1741**. In New Jersey, call collect **201 461-3400**.

Auragen
Systems Corp.
THE NATURAL SELECTION

AURAGEN Systems Corp.
Two Executive Drive, Fort Lee, NJ 07024

AURAGEN, AURANET and AUROS are registered trademarks of AURAGEN Systems Corp.
UNIX is a registered trademark of Bell Laboratories

©1983 AURAGEN Systems Corp.

IN DEPTH

software product were all undertaken by the same small, closely integrated group of specialists — is rapidly disappearing. In its place is emerging a system organized much like a traditional assembly line: Individual workers are assigned

small pieces of a larger task, which in turn is part of still larger tasks. Even the name of the occupation has been changed to reflect this transformation: We talk less of "programming" and more of "software production."

Our findings confirm

what industry observers have long noted: Documentation, report writing, coding (particularly in Cobol) and maintenance are now distinct jobs, not merely specializations. Comparatively speaking, they are not particularly well-paid. Similarly,

systems design, departmental planning and so on are also now distinct jobs. In contrast to the first group, they are paid relatively well.

The elaborate division of labor emerging in software work is sometimes — and mistakenly — called special-

ization. It is more accurately called fragmentation. Increasingly, software work is characterized by a stratification of responsibility and pay, not just a division of labor. What is unclear is whether there is a direct career path between low-paying and high-paying positions.

The software field is still too new to have developed rigid or even clear-cut career paths. Some clues to possible paths can be found, howev-

The elaborate division of labor emerging in software work is sometimes — and mistakenly — called specialization. It is more accurately called fragmentation.

er, in the history of older engineering and technical fields. Early engineering resembled programming to the extent that it began as a master-apprentice occupation. Training was informal and acquired on the job. Eventually, the engineering fraternity, under pressure from industry, adopted elaborate formal training requirements. It also developed into an increasingly fragmented occupation that replaced the plain "engineer" with "technicians," "designers," "managers" and "entrepreneurs."

Most studies of modern engineering agree that these specializations are distinct careers that do not overlap. To put it in management terms, there is no single engineering career ladder but several. They are not "parallel" and, by and large, they do not overlap.

Is the software field following the example of engineering? It is probably too early to say for sure, but many of the signs indicate that it is. Although we have not yet completed analysis of our data on training and education, we have done a quick, preliminary examination. The data shows a three-tiered software training establishment that roughly corresponds to the technical school/college/university division characteristic of engineering training. Although we believe that, at present, career opportunities in software are not rigidly associated with formal credentials, we do think a trend in that direction is likely.

We're Lowering the PRIME RATE!

PRIME TIMES

Quadrex Subdistributor Program Successful

Quadrex passes PRIME Discounts On to You.

Software vendors and system builders, join Quadrex's growing network of Prime subdistributors, and take advantage of our discount on Prime computer systems.

As a high-volume integrator of Prime equipment, Quadrex can offer you one of the highest discounts on Prime systems and peripherals, plus a host of other benefits, including:

- Quadrex engineering assistance for hardware integration and system configuration.
- Software conversion for programs currently running on IBM, DEC, Modcomp and other systems.
- Discounted pricing on all your non-Prime peripherals including terminals, printers, plotters and modems.
- Quadrex's 14 years of experience and financial stability, plus a fully-staffed department dedicated to the Prime subdistributor program.

As a member of Quadrex's nationwide network of subdistributors, you'll have access to the Quadrex software catalog for a vast selection of other Prime software to broaden your market base and boost your Prime sales. By the same token, the entire subdistributor network becomes a potential nationwide salesforce for your product.

At semiannual subdistributor conferences, you'll meet and share ideas with other vendors of Prime applications software. Your quarterly subdistributor newsletter, with troubleshooting success stories and technical notes, lets you benefit from the experience of other Prime system builders in the Quadrex network.

Whether you sell one system or 100, you get the same high discount on Prime equipment through Quadrex. As Quadrex's volume increases, we'll pass on to you our graduated dis-

count from Prime. Start as a small subdistributor, and gradually increase your sales volume.

With Quadrex, your subdistributor contract is non-exclusive and includes no minimum sales volume or obligation to buy. We think you'll find our service and responsiveness enough incentive to stay with Quadrex.

For more information about the advantages of the Quadrex subdistributor program, call us at (408) 370-4266 or write to Procurement Services Marketing Manager Quadrex Corporation 1700 Dell Ave., Campbell, CA 95008



IN DEPTH

Women. A major development in software is the changing role of women. As we described earlier, software work is relatively open to women, particularly in comparison to other technical and engineering fields. On the other hand, our data shows conclusively that women are concentrated in the lowest paid jobs: business programming, documentation and maintenance. They are also concentrated in the worst-paying industries: financial/real estate and communications.

Furthermore, women are paid less in every specialization, in every industry and at every organizational level.

In fact, there is not a single industry in which women achieve pay parity with men. Ironically, the only industry in which women come close to pay parity is financial/real estate, the second-worst paying industry. Only at the bottom of the pay ladder, it seems, are women equal.

At the management level, the pay disparity is even more dramatic. Women supervisory workers earn less than their male counterparts at all levels of management. In fact, the higher a woman goes through the management ranks, the greater the discrepancy between her pay and the pay of her male colleagues: The higher up she goes, the lower her relative income. To state the situation in the baldest terms, on average, the lowest-paid male manager makes more than the highest-paid female manager.

Software has enjoyed a reputation as a field relatively free of discrimination and in particular as a field open to women. Yet the systematic pay discrepancies make a strong case that the field is not characterized by just random pay discrepancies but by systematic pay discrimination against women.

In light of the remarkable pay differences, the entry of large numbers of women into the software field takes on another and perhaps sinister

The only industry in which women come close to pay parity with men is financial/real estate, the second-worst paying industry. Only at the bottom of the pay ladder, it seems, are women equal.

meaning. If the field has indeed polarized into relatively creative, relatively well-paid jobs on the one hand and relatively routine, relatively poorly paid jobs on the other, then

women seem to have been recruited to fill the openings at the bottom. Even when they achieve top management positions (or even more rarely, when they enter esoteric sci-

entific and technical specialties), their pay is considerably lower than men's.

It is useful at this point to compare male/female pay discrepancies in the rest of the work force, particularly at the management level. What we find in the U.S. work force as a whole are roughly the same male/female pay discrepancies that we have found in software work. Similarly, women managers in the U.S. work force experience the same degree of pay discrimination characteristic of software. In effect, software work isn't

Mercurion 1

The page-per-second non-impact printer matched to your computer

...and priced to change all your thinking.

Now Mercurion 1 makes non-impact printing as cost-effective as it is performance-effective. Revolutionary ion deposition imaging—far simpler and more reliable than laser xerography—gives you letter quality printing, and on standard 8½ x 11 paper now demanded by government and most businesses. All of this, plus 5,280 lines-per-minute.

At an initial cost less than 50% that of conventional non-impact printer systems, Mercurion 1 also substantially reduces maintenance costs, downtime, and per-page operating costs. And does it quietly (55dBA).

A simple, user-friendly control panel lets you set margins and tabs, select fonts (up to 8 styles and sizes), program number of copies (1 to 255), feed a single sheet for alignment, put the system through self-test, and much more. Resolution is 240 x 240 pixels, and you can select landscape or portrait orientation.

Mercurion 1 is plug-compatible with all popular mini- and mainframe computers. It's designed to replace your existing impact line printer directly—no operating system software changes. We even supply the cable.

And you can count on SSI quality and service support. Thousands of our printer systems are in use worldwide.

Call us or mail the coupon below for a fully-detailed brochure on this great new printer system.

SSI Southern Systems, Inc.

2841 Cypress Creek Road
Ft. Lauderdale, FL 33309
(305) 979-1000 (800) 327-5602
Telex 522135

Southern Systems Canada:
(416) 229-2589

Yes, Mercurion 1 sounds interesting.
Rush brochure to:

Name _____ Title _____
Company _____
Address _____
City, State, Zip _____

VOLUME DATA ENTRY SERVICES



Call Our TOLL-FREE
HOTLINE
For Instant Quotes
800-228-9410

FOR OVER 14 YEARS

**AMERICAN
KEY DATA**

5314 S. 99th ST. • OMAHA, NE 68127

IN DEPTH

that different after all.

There are at least two ways to view male/female pay discrepancies in software. Women in software work are, on the whole, no more discriminated against than in other occupations. Indeed, they do somewhat better. Even if women are paid less than men on the average, there are considerably more women in software than in most other engineering occupations: 24% vs. perhaps 2%. Furthermore, their pay, relative to other women, is high.

This figure may actually explain why there are no major statistical differences in male and female job satisfaction. Men compare their pay with that of other software specialists. Women, on the other hand, probably

At least in software work, high tech has not yet fulfilled its potential to be not only new but "different" with respect to equal opportunities for women and minorities.

compare their (relatively high) pay with that of other women.

The second view is less optimistic. Software work is barely 40 years old. It does not carry the burden of a tradition of discrimination against women. Indeed, modern computer programming began as an all-female occupation. In 1943 through 1944, responsibility for programming the Eniac belonged to a group of young women just out of college. Similar, if less dramatic, roles were played by women on the Mark projects at Harvard University and in the development of some of the first high-level languages, such as Cobol. Yet women in software today still face about the same kinds of structural discrimination as they do in the rest of the work force.

Recall, too, that black Americans have been all but excluded from the job opportunities promised by software work. Women, although relatively better off, are still confined to the least responsible, most routine, worst-paying (and probably dead-end) jobs. For whatever reason, software work has replicated the sexual (and racial) divisions that characterize older occupations. At least in software work, high tech has not yet fulfilled its potential to be not only new but "different" with respect to equal opportunities for women and minorities.

The Future of Middle Managers. The third and perhaps most significant change in software work is the position of middle managers. As sharp as the male/female pay differences are, the differences in management pay are even more striking. For example, overall, managers make about 20% more than nonsupervisory personnel. Low-level supervisors make 18% more than nonsupervisory workers.

Low-level supervisors make 18% more than nonsupervisory workers. Upper-level managers make a whopping 82% more than middle managers. Middle managers, on the other hand, make only 8% more than low-level supervisors.

Upper-level managers make a whopping 82% more than middle managers. Middle managers, on the other hand, make only 8% more than low-level supervisors.

Why are middle managers paid so little? In this case, the simplest explanation is that the market pays middle managers what it thinks they are worth. Many business analysts have

noted that American industry as a whole has been moving away from the traditional pyramid structure of organization — with its many levels of management between top and bottom — toward a form sometimes described as an hourglass.

In other words, organizations are now moving toward a structure with the majority of its employees on the bottom, a very small group of top-level managers and specialists on top and a communications channel connecting the two. The communications channel, of course, performs



IN DEPTH

the functions that were previously the responsibility of middle managers. Because there are relatively fewer positions in the middle but more people than ever competing for them, employers today do not have to pay a very high premium for middle managers.

We suggested earlier that software is probably more like than unlike traditional industries. If this is the case, then the relatively low value the market places on the services of middle-level software managers is entirely consistent with the broader

The relatively low value the market places on the services of middle-level software managers is entirely consistent with the broader trends in U.S. industry as a whole. Middle-level managers are caught in a squeeze. Like their counterparts in other fields, they are on the verge of being replaced by a machine.

trends in U.S. industry as a whole. Middle-level software managers are caught in a squeeze. Like middle

managers elsewhere, they are on the verge of being replaced by a machine. The irony is that the machine

that threatens to replace them is one many of them have helped build.

In Conclusion

It is assumed that software workers are well-paid and generally satisfied with their jobs. By and large, both of these perceptions are correct. Similarly, it is widely believed that the field is much more open to women than other technical occupations. This belief, too, seems based in fact.

On the other hand, our data suggests a different and less encouraging aspect of software work. If women are welcomed in the industry, they are paid considerably less than men. Although male and female entrants are initially paid about the same, the earnings of women flatten out quickly. The earnings of men, on the other hand, seem to increase in a regular way. The pay differences between male and female managers, in particular, are dramatic. An equally large gap in earnings characterized employees of small organizations.

The pay situation of women is reflected in perceptions of discrimination. Women are more likely than men to say they have been discriminated against. Interestingly, a significant minority of both men and women complained about age discrimination.

If the situation of women is not as rosy as the popular image suggests, the situation for black Americans is probably worse. We say "probably" because there are so few blacks in our (or anyone else's) sample. For whatever reason, software work is not the place for black Americans to find jobs.

Another popular conception is that software work is a wide open field. It rewards people on the basis of what they can do rather than who they are. Here, too, preliminary analysis of our respondents' training suggests a different picture. By a large majority, software specialists are college graduates. Most have some formal technical training. Moreover, the younger specialists are, depending on one's perspective, either better educated or more narrowly trained than their elders. Whatever the consequences for the quality and quantity of software, the emergence of de facto credentials in the form of college degrees suggests that the software field has begun to mature. In plain language, "maturity" means that the most important thing about software is not how different it is from other kinds of work, but how similar.

About the Authors

Philip Kraft, principal investigator, is associate professor of sociology at the State University of New York at Binghamton. He is the author of *Programmers and Managers: The Routinization of Computer Programming* (Springer Verlag, New York) and numerous articles on the computer industry.

Steven J. Dubnoff, co-principal investigator, is a study director at the Center for Survey Research, University of Massachusetts, Boston. He is an economic sociologist.

DREX

Just the facts: Why your next 3270 cluster should be a Memorex.

When you're good, you don't have to shout. Our 3270 family of controllers, printers and display stations is the best you can buy. So, to prove our high opinion, a few quiet facts:

Plug-compatibility with IBM mainframes. Plug Memorex terminals in and protect your existing investment.

Wide range of protocols. Operate in BSC or, with our new 2074 controller, SNA/SDLC.

Monitors that make a difference:

Crisp, high resolution characters and graphics.

Choice of easy-to-read green phosphor, new amber or seven-color screens.

Ergonomic design for increased productivity.

Economy in operation. Our display stations use up to 58% less power than their largest competitors. Our printers run up to 50% faster than comparable models.

Available when you need them. Many items are available immediately. Ask about our quick delivery program.

Worldwide service. Quality computer peripherals and media for over 22 years. Sales and service that span the globe.

Call today for more information. Our toll free number is (800) 538-9303; in California (408) 996-9000, Ext. 616. Or write to Memorex Marketing, 18922 Forge Drive, Cupertino, CA 95014. Once you've got all the facts, we're confident of your decision.

MEMOREX

A Burroughs Company

**Now! Available with ergonomic keyboard and easy-to-read amber screen!
See Memorex at Comdex, Booth 1236.**

Two ways to take 3270 where it's never been before.

**True
blue.**



If you're thinking of extending your 3270 network, true blue is a great way to go. Just install IBM's 3270 series controllers, terminals or printers. As many as you need. Or can afford.

Then connect them. If the new IBM peripherals are going across the room or down the hall, you'll need a little high-cost cable. And if they're going across town or further, add some very expensive leased lines.

True blue. If you can afford it.

**Or an
economical,
reliable,
secure
3270 network
of a
different
color.**



Fortunately, there's a better way. Datastream.

Our Remote Cluster Controllers let you take your 3270 network anywhere you need it. You can build clusters using low-cost ASCII terminals, printers and personal computers. The Remote Cluster Controller provides main-frame compatibility and 3270 functionality to the entire cluster.

And we've got a list of features that won't quit. Models for either 3270 SNA or 3270 BSC networks. Direct-connect or dial-in access from every terminal in the cluster. Sophisticated password security. Remote diagnostics and system upgrade. Multi-host support. And more.

If you want to take your network down the hall or across the country. Without the heavy expense of cables, leased lines or IBM peripherals. Call us.

Datastream. You can't afford to overlook us.

Call toll free: 800-952-2500
(Outside California)

DATASTREAM

2520 Mission College Blvd.
Santa Clara, CA 95050
408/986-8022

Can the People's Republic Catch Up?

An American finds the Chinese decades behind and asking the wrong questions.

By Vaughn J. Mantor

Dai ye in Mandarin means "waiting for work." The Chinese use the phrase to describe 17-year-old graduates who have not yet been assigned jobs. Chinese programmers also wait. They wait for the rest of the Chinese computer industry to tell them what to do. They will continue to wait.

Early last August, 27 software specialists from the U.S. embarked for the People's Republic of China. We stayed one month and visited six cities along the eastern coast. All of us were, in one way or another, anxious to speak with the Chinese about computer software.

We found an underdeveloped software industry which we would estimate at from 10 to 20 years behind the U.S. We also found a naivete about software that reminded us of our own misunderstanding of the nature of software 10 or 20 years ago. For example, in Beijing on the first day of our tour, one man asked, "We have the IMS data base at the Census Bureau, but we have heard of System R, a relational data base. Which one is better? Which one should we use?"

Even if we could have spoken without an interpreter, it would have been difficult to explain how dozens of factors,



IN DEPTH

affect the choice of a data base management system (DBMS) and how it would be unprofessional to recommend one over another categorically.

I don't mean to malign the Chinese. They are intelligent, hardworking and genuinely interested in the computer field. They have read much of the academic and theoretical literature. But they are unaware of the vast and difficult engineering that is necessary to build modern software. Their naivete stems from the country's self-imposed isolation of 30 years. Unfortunately, their sim-

Some time before our group arrived, the Chinese made a list of topics in which they were especially interested: data bases, microcomputers, local-area networks and on-line transaction processing and data base applications.

plistic notions are not limited to the computer field. While we were there, a petroleum engineer asked a Texas oil man, "What is the best way to drill for oil?"

Some time before our group arrived, the Chinese made a list of topics in which they were especially interested: data bases, microcomputers, local-area networks and on-line

transaction processing and data base applications. Most of our delegates prepared presentations on these subjects. In each of these areas we found the Chinese knowledgeable about theory but ignorant of how to apply it. It is fair to say that even their theory is not quite current.

The data base is probably the most popular topic in China. But as in other areas, the Chinese ideas of data bases are similar to our ideas a few years ago. The story about Zhangzhi is one example. There are others. At a university near Guangzhou, a master's degree student is doing his thesis work building a data base manager that has the functions and organization of Cincom Systems, Inc.'s Total. Although this student is familiar with the work of Edgar F. Codd and others on relational data bases, his knowledge (and the knowledge of most graduate students) about engineering a data base

Turns Spaghetti Code COBOL Into Structured COBOL Automatically.

SUPERSTRUCTURE takes your unstructured COBOL programs and automatically produces structured COBOL programs that are easy to understand and maintain. SUPERSTRUCTURE provides a simple and cost effective alternative to manually rewriting those unstructured programs that are a maintenance nightmare. Of course you can't believe it. Let us prove SUPERSTRUCTURE works, using your programs at your location. SUPERSTRUCTURE—the breakthrough you've been waiting for. Call today. Marketing Director — SUPERSTRUCTURE

Group Operations, Incorporated
1110 Vermont Avenue, N.W.
Washington, D.C. 20005
(202) 887-5420
Offices in Boston,
Cleveland, Dallas,
Los Angeles, and New York.



The largest project ever done by the Shanghai Technical Services Corp. — the only one I know of in the province — contains 25,000 lines of Fortran.

management system is lacking.

It's not as if the Chinese have no experience with data bases. The Census Bureau uses IMS, another agency uses Digital Equipment Corp.'s DBMS 10/20 data base, and there are a few installed applications which, at the least, demand some on-line file manipulation and searching. For example, in Shanghai, there is a semi-automated telephone directory assistance system. With it, an inquiry for a number can be answered in three to five seconds.

The problem is the limit of the data base technology that supports the system and the limited incursion of the technology into the society. As far as I know, Shanghai boasts the most sophisticated directory assistance system in China. But the city has fewer than 60,000 telephones to serve its 11 million residents. And the data base is extremely stable because virtually all of the telephones are in business, state organizations and hotels for foreigners. Moreover, the directory assistance system is regularly shut down for reorganization and backup, which forces users to call back later.

The Chinese showed their need for data base engineering expertise in other ways as well. In Shanghai, one of the presentations that was particularly well received addressed the performance evaluation of data bases. By the audience's questions, we concluded:

1. The Chinese are just beginning to consider the question of data base performance.



**WHEN IT COMES
TO COMPLETE
SOFTWARE SOLUTIONS,
THE FACTS PROVE
WHO'S KING**



HARD

ABOUT THE REAL LEADER FOR BUSINESS: RAMIS II

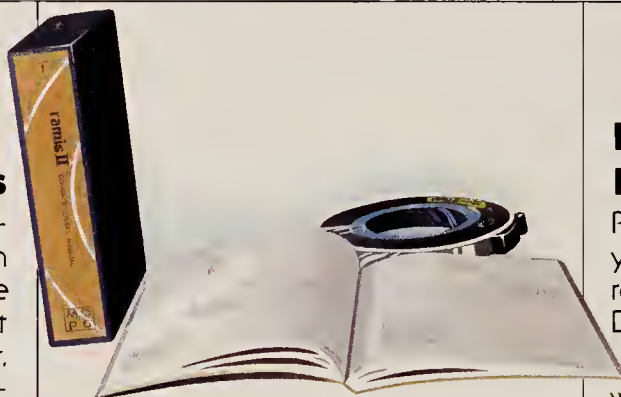
FACT:

RAMIS II Is The One System For All Your Users

To meet the full spectrum of application development and Information Center needs, RAMIS II starts with the most advanced decision support capabilities: a powerful report writer, a complete relational language, full-color business graphics and much more.

Then we add a data base manager robust enough for high-performance on-line applications, a multitasked TP monitor that minimizes overhead and state-of-the-art screen formatting.

The result is the only integrated data base/data communications system designed for both highly structured transaction processing applications and unstructured decision support systems. And the only product designed to fully unlock the power of your IBM mainframe, whether it's a 4321 running SSX or a 3081 running MVS/XA.



FACT:

More Copies Of RAMIS II Have Been Sold Than All Other 4GL's Combined

RAMIS II is the leading fourth-generation language, in sales as well as technology. In fact, in 1982 ICP rated RAMIS II the fourth best selling systems software product of all time—and products one through three had each been on the market at least twice as long as RAMIS II.

FACT:

RAMIS II English Makes Ours The Most Friendly System

No longer do you have to learn a complex, specialized computer language to access data. Instead, using an extensive built-in knowledge base, RAMIS II comprehends and responds to everyday English. Even if you have never used a computer before, our advanced artificial intelligence technology enables you to ask questions, obtain answers and create reports in only a few minutes.

FACT:

RAMIS II Unlocks Your Existing Data

RAMIS II maximizes the return on your investment in data through ready access to ADABAS, IMS, TOTAL, DL/I and IDMS data bases, as well as VSAM, ISAM and sequential files.

With the most powerful report writer available, plus graphics, RELATE and even English comprehension, RAMIS II unlocks external data easily and efficiently.



RAMIS® II...The Leader By Design

FACTS

IN COMPLETE SOFTWARE MIS II FROM MPG



FACT:

MPG Developed The First Practical Relational Language

RAMIS II's RELATE provides direct relational access to virtually any file, no matter what its size or format, without compromising hardware performance. What's more, you get all the power of relational theory through simple, English-like commands.

FACT:

There's No More Powerful System For Screen-Based Applications Than RAMIS II

RAMIS II's FSM, another recent MPG development, speeds construction of vital screen-based applications, even by users with little computer expertise. The developer simply "paints" the desired format on the screen and selects attributes from a menu of more than twenty choices.

FACT:

RAMIS II Was The First Product Designed For Both Application Building And Information Centers

Because we began developing a complete software solution in 1977, long before it became fashionable, no other product comes close to the comprehensive, integrated capabilities of RAMIS II. And no one comes close to its ease of use, its portability or the productivity it delivers.



All This, Plus The Full Commitment And Support Of Martin Marietta

Leadership takes vision, plus the commitment and resources to turn that vision into bold new products. To achieve our goal of a complete software solution, we have invested an average of 16% of annual revenues in research and development—more than twice the industry average.

Now, as part of Martin Marietta Data Systems, we offer a complete range of information solutions, from software products to professional services, from processing services to integrated systems. And, the financial and technical strength of Martin Marietta, a diversified company with more than \$3½ billion in revenues, is accelerating new product development.

It's easy to claim leadership. But when it comes to providing a complete software solution, the facts prove there's only one real leader—RAMIS II from MPG.



WE'RE TAKING THE ROAR OUT OF THE OTHER SOFTWARE COMPANIES THAT CLAIM TO BE KING



To get the complete facts, visit one of our regional Product Demonstration Centers or attend a free RAMIS II seminar. Discover for yourself why RAMIS II is the leader in complete software solutions.

RAMIS II Seminars

Seminars are held frequently in major cities. Call to find out the date and location of the next one near you.

Product Demonstration Centers

Our Product Demonstration Centers are specially designed to show you RAMIS II in action in a comfortable, small-group setting.

Toronto	Princeton	Paris
Chicago	San Francisco	Milan
New York	Washington, DC	Sydney
Houston	London	
Los Angeles	Heidelberg	

To register for any of these events or for more information, call your local MPG office or call toll free (800) 257-5171. (In New Jersey call (609) 799-2600, Ext. 2325.)

**Mathematica
Products Group**
A Martin Marietta Data Systems Company

Copyright © 1983 by Mathematica Products Group, Inc.

P.O. Box 2392/Princeton, NJ 08540
(800) 257-5171/(609) 799-2600
Telex: 843479



Boston (617) 357-9424 Chicago (312) 870-9710 Houston (713) 850-8697 Los Angeles (213) 670-6962 New York (212) 980-9077 Princeton (609) 799-2600 San Francisco (415) 461-6100
Washington, DC (202) 484-5752 Basel (61) 429923 Bergen (5) 32 13 00 Heidelberg (6221) 14051 Hong Kong 5-435714 Kingston (809) 929-7223 London (1) 580-3681 Milan (2) 5461-80
Montevideo (2) 906788 Ottawa (613) 236-8616 Paris (1) 774-8081 Santiago (2) 31014 Singapore 273 9255 Stockholm (8) 520720 Sydney (2) 923 1677 Tel Aviv (52) 70364 Toronto (416) 603-0000

2. They did not realize how difficult it is to measure performance.

3. They had not yet considered the difficulty of separating the measure of the data base's performance from the measure of its performance in a particular environment.

4. They were not familiar with the standard benchmarks of the commercial data bases.

Although the Chinese are enthralled with data bases, they realize that well-designed data base management systems are only academic exercises unless applied to problems. Understandably, they were not as enthusiastic about this more mundane topic. For the Chinese, building applications with data bases is quite possibly a bigger problem than building the DBMS.

There are several reasons for this apparent contradiction. First, using a data base to support management information systems is not usually economically feasible unless there is a relatively large body of data to manage. That requires substantial disk storage, and disk storage is prohibitively expensive and very difficult to come by in China. Data bases in management information systems usually mean large numbers of transactions, and to process them takes computing power — power the Chinese rarely have.

Most data bases are supported by ancillary and complementary systems such as a teleprocessing monitor for inquiry and update. Much of this support is unavailable to all but a few installations in the country.

Besides the difficulty of obtaining support, the Chinese have little experience in developing systems large enough to warrant data bases. The largest project ever done by the Shanghai Technical Services Corp. — the only one I know of in the province — contains 25,000 lines of Fortran. The only commercial transaction processing system built in Tianjin, the third largest city, is a limited batch banking system.

In the building of applications systems, the Chinese appear to be farther behind than in most other areas. While we are looking at prototyping and generation as ways to automate the development of transaction processing systems, the Chinese are struggling to handcraft them.

Large-scale systems also demand more attention to the management and control of the development project and the accuracy, succinctness and organization of system specifications. During our entire trip from Beijing to Guangzhou, I found no evidence the Chinese are aware of the methods currently in use in the U.S. such as Warnier-Orr or Yourdon for management or specification.

Microcomputers are also of great interest to the Chinese. Just after we returned, the Committee for Science & Technology decided that the hardware industry would concentrate on the development of micros as opposed to minis or large computers. Because the economy is centrally

The Committee for Science & Technology has decided that the hardware industry will concentrate on the development of micros as opposed to minis or large computers. The micro segment of the industry will be given the resources to expand and develop new products at the expense of the other two sectors.

planned and administered, this pronouncement means the micro segment of the industry will be given the resources to expand and develop

new products at the expense of the other two segments. The Chinese will diminish or discontinue research and development on large

machines and their ancillary hardware and software systems.

Although I disagree with the principles of a centrally planned economy, I do not know if it is a mistake for the Chinese to concentrate on microcomputers. I do know that if China tries to catch the micro technology of the West, the effort will be like trying to hit a rapidly accelerating target. In Shanghai, we were told the Chinese are able to build only 4K chips, and the yield from the manufacturing process was only 30%. But they said they were researching 16K

Introducing the Radio Shack TRS-80® Arcnet™ Integrated Office System

■ Link from 3 to 255 Individual TRS-80 Microcomputers Into a Local Network

■ Keeps Productivity High, Costs Low

■ Share the Same Programs and Peripherals

■ Users Perform Independent Tasks without Interruption

■ Based on Datapoint's Field-Proven "ARC" Technology

■ Available for Immediate Delivery



Now, an Affordable Computer Network. Radio Shack's new TRS-80 Arcnet is a full-function local area network that interconnects all of the TRS-80 Model 12 and Model II computers used in your office. Office personnel can share the same collection of programs and up-to-the-minute information—without realizing that anyone else is even on the network! They even share the same printers, hard disk systems and other peripherals, which results in significant cost savings. And with Arcnet, you can add more power by adding more computers—at about \$400 per computer.

Get the Big Picture. Stop by one of our selected Radio Shack Computer Centers for a demonstration—today!

Radio Shack

The biggest name in little computers®
A DIVISION OF TANDY CORPORATION

Send me a free Arcnet brochure and TRS-80 catalog.

Mail To: Radio Shack, Dept. 84-A-544
300 One Tandy Center, Fort Worth, TX 76102

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
TELEPHONE _____

Arcnet is a trademark of Datapoint Corporation.

IN DEPTH

chips and 16-bit architecture. Compare these ventures with IBM's announcement of the 512K chip or Hewlett-Packard Co.'s 32-bit micro.

Moreover, the price of Chinese microcomputers is very high, beginning at about \$14,000. Even though the labor is inexpensive — 10 cents to 17 cents an hour — the cost of parts is exorbitant, availability is low and service is intermittent at best.

Chinese-made micros are based on the Intel Corp. 8080 but do not contain an 8080. They have a wired-board equivalent. The error rate in wiring the board contributes to the high cost and low reliability. Even if the Chinese add huge import duties to the cost of foreign-made microcomputers, they will probably be able to import them more cheaply than build them for the next 20 years or more.

The fourth area in which the Chinese are most interested is local-area networks. Here, too, the West's lead is large. I do not believe there are any local networks in regular use in China outside research installations. The gap between the Chinese ability and the West's is so big, they are incredulous at some of our advances. During a presentation about Omninet, one of our delegates from Corvus Systems, Inc. was interrupted by one of the Chinese who said, "That's not possible." The speaker was describing an installed feature of Omninet.

The Country's Needs

Before one can grasp the predicament of the Chinese computer industry, one must try to understand the relationship between the computer and Chinese society. In China, labor is inexpensive; materials and machinery are expensive. Information and knowledge are dear and to be hoarded, but time (in a society with a recorded history longer than 5,000 years) is less important than it is to Westerners.

In the West, where labor is expensive, we have used the computer as a labor-saving device. But in China, using a \$5,000 computer instead of 10-cent-an-hour labor means the computer cannot possibly pay for itself in less than 15 or 20 years. Moreover, Chinese managers rarely have the authority to fire employees, so the computer may not save any labor costs at all. Many of the possible users in China are not interested in computers for this reason that labor is cheap and computers are expensive.

Cheap labor is not the only barrier to greater use of computers in China. We take for granted the phone system, the ready availability of replacement parts, supplies and service and at least some standardization among the models built by any particular computer manufacturer. The buyer of a Chinese computer cannot, as a matter of course, find these supports. Although many Chinese don't see the need for computers — and in spite of the great obstacles to installing them — China's leaders eagerly want them. They understand the

Even if the Chinese add huge import duties to the cost of foreign-made microcomputers, they will probably be able to import them more cheaply than build them for the next 20 years or more.

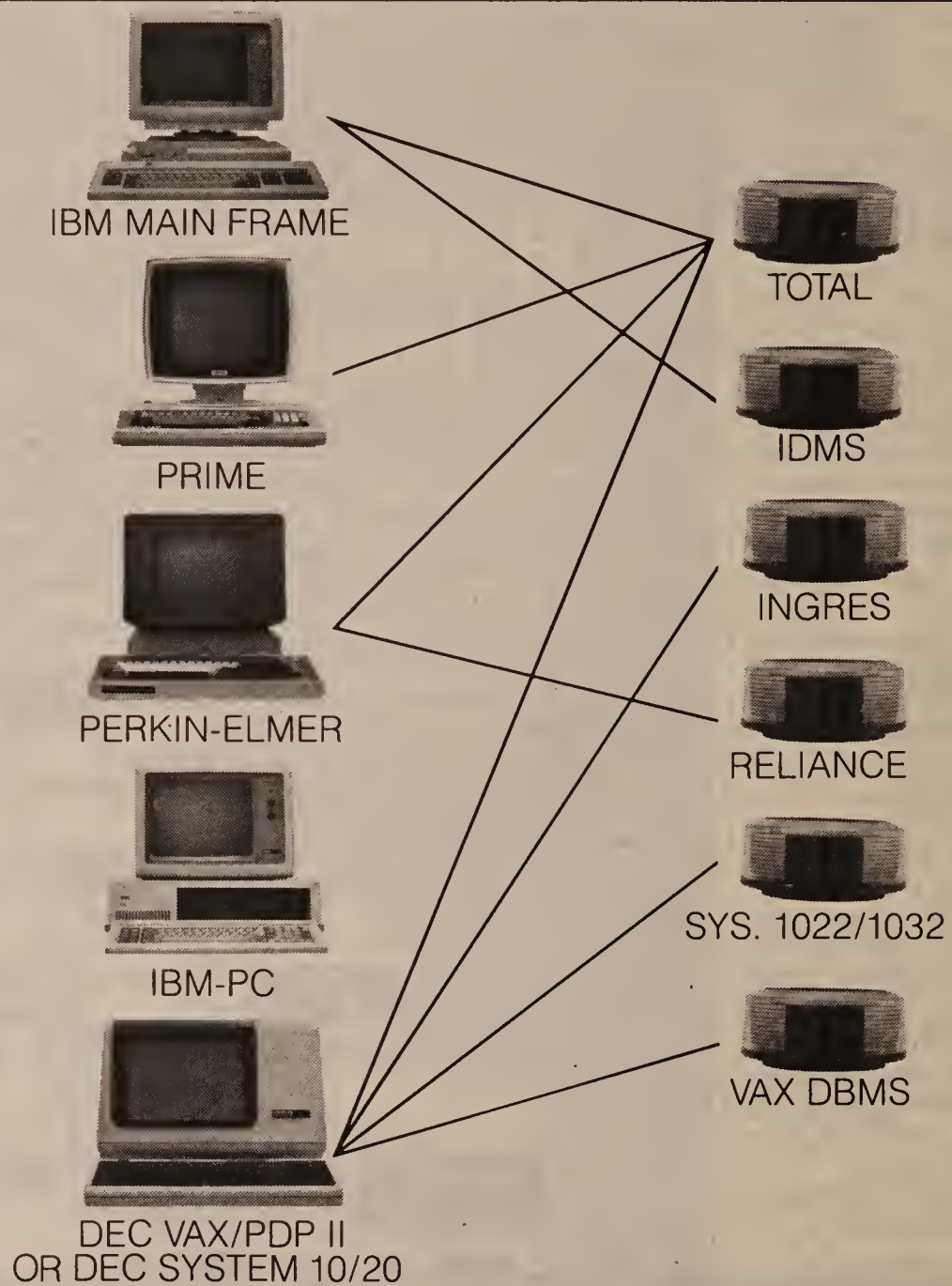
country's computer needs, and the needs are urgent. China has more than one billion people, mostly farmers, and grows by 17 million more every year. It may be possible (al-

though unlikely) to run an agrarian, regulated, controlled, centrally planned society of a billion souls without computers, but a modern society based on industry, information

and services is impossible without them.

And China's leaders are anxious for their country to become a modern society.

In its anxiousness to be modern, China has begun a program called the Four Modernizations. This scheme is supposed to transform China into a "powerful socialist economy" by the year 2000. The four sectors of the society selected for rapid modernization are agriculture, industry, defense and science and technology. Many of China's computer



MIX VS.

No DBMS matches SEED for transportability. No DBMS offers you a wider range of hardware options now and for the future. Whether you opt for DEC, IBM, Prime, Perkin-Elmer or GOULD CSD.

And SEED lets you transport applications across machines—micro to main-frame or the reverse. SEED also provides the only compatible path from DEC 10/20 to IBM and VAX.

Because SEED is so transportable, it

enables you to standardize development efforts to increase programmer productivity. In short, SEED helps you get the most out of both your hardware and your human resources. And we back SEED with our own resources—a team of experienced professionals that gives you personalized, on-going support and service.

Seed Software, 2300 Walnut Street, Suite 734, Philadelphia, PA 19103.

specialists claim the government ranks computing among the most important technologies. However, the plans seem too ambitious to be finished by the turn of the century, and the computer sector appears to be a little behind schedule.

China may even be too far behind to soon build its own international computer industry; they will probably import computer technology for many years. The supporting goods and services that are needed for a computer industry do not exist or are difficult and expensive to get. By the

time the Chinese build them, computer technology will have moved ahead again.

Besides lacking management information to run the country, the Chinese lack technical information. The government prohibits or discourages importing much of the West's literature. The U.S. and other countries will not allow export of certain technology and information to China. And much of the literature is just too expensive for the individual Chinese.

With wages of \$60 per month, a

university professor could hardly afford a \$50 subscription to the *Communications of the Association for Computing Machinery*. Even a \$24 subscription to *Time* or *Newsweek* represents two weeks' wages or more for most Chinese. China's economy, politics and technology argue against any significant computer industry in the foreseeable future. And as long as the West prohibits export of advanced computer technology, China will stay in the rear.

Unfortunately, one of the big problems facing the Chinese com-

puter field is the language. As yet, the Chinese cannot process their own language.

There are probably more than 50,000 characters, or pictographs, in Chinese. However, there are only 400 syllables, so a single sound can represent more than 100 different pictographs. If that were not enough of a difficulty, the tone or pitch of the syllable changes its meaning. There are four tones in Mandarin — level, up, down and up, and down — but nine in Cantonese. Both spoken and written Chinese are so different from languages using alphabets that they inhibit China's computer technology.

A number of researchers in China

The Chinese lack technical information. The government prohibits or discourages importing much of the West's literature.

are searching for ways to manipulate Chinese characters in computers. To date, they have solved only the I/O problem. They have a keying method for input, an arbitrary encoding or numbering scheme and special output software that drives special dot matrix printers and CRTs.

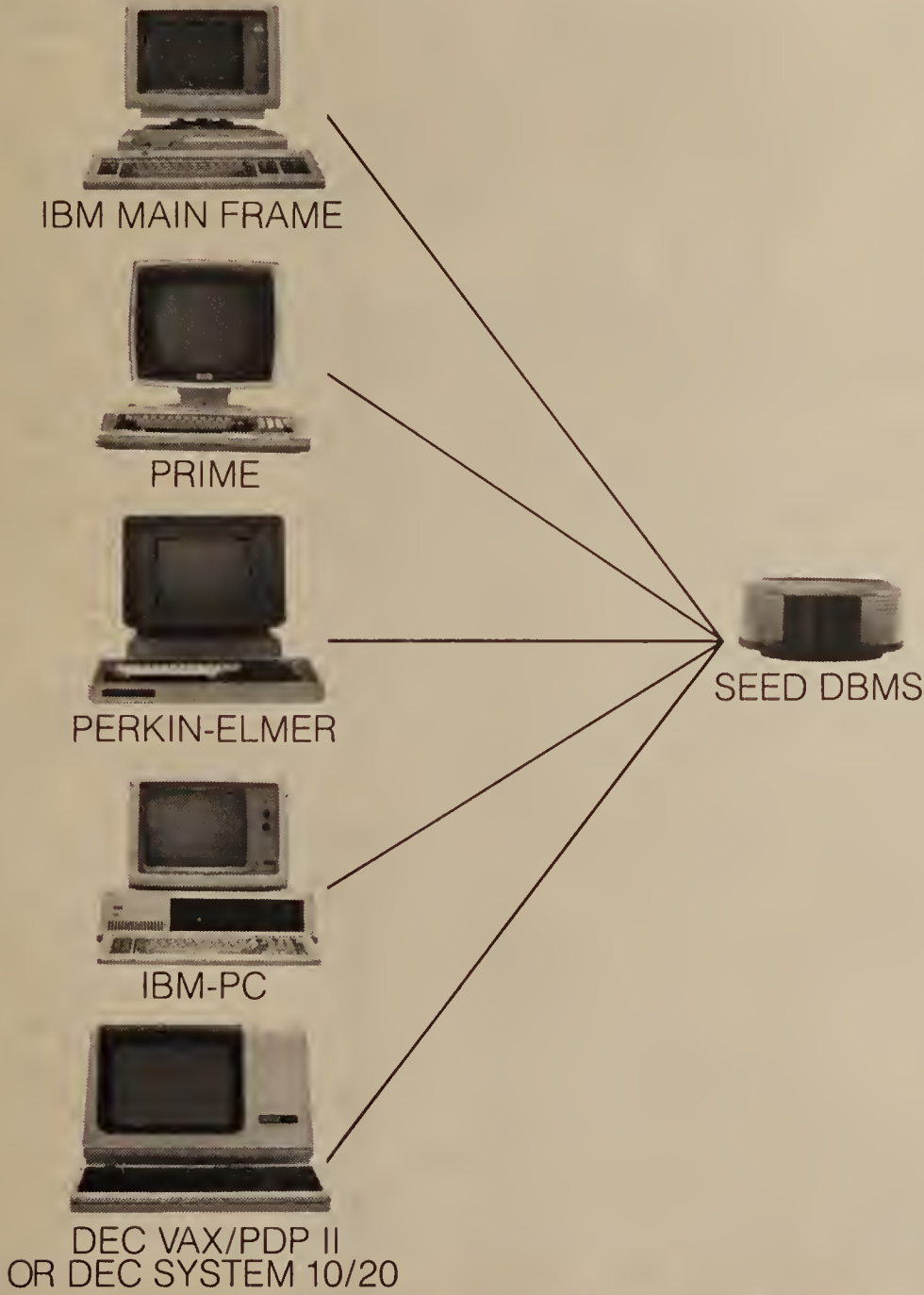
Because so many people are working on the problems, there are several different solutions to I/O.

None are particularly elegant or efficient. The first solution was no more than a typewriter-style keyboard with hundreds or thousands of keys. Another solution is a touch-sensitive, flat, plastic board about 18 in. by 30 in. Various sections of the board are marked in different colors. There is a row and column array within each colored area. Each cell of the array contains one, or occasionally two or three, Chinese characters. The operator enters a character by touching the character on the board with the wand.

A third solution uses a standard typewriter-like keyboard with an alternate function key. Holding the alternate function key, the operator can draw the "strokes" of a character by pressing various English letter keys. It can take up to eight strokes to define a Chinese character, and even then there may be some ambiguity. None of these methods are very efficient, and they do not allow a programmer to do anything other than read, store and display Chinese characters.

In the simplest storage schemes, each character is stored as an arbitrary, 16-bit number. However, there does not seem to be any available method for processing with the stored characters — no sorts, no merges, no comparisons — because the code does not conveniently correspond with meaning.

The display of Chinese characters



MATCH

Send for your **FREE SEED Information Kit** today. Get all the details on how SEED DBMS increases productivity for managers, programmers and end-users, and how SEED makes DBMS maintenance and operation

☐ Send me the FREE SEED Information Kit. ☐ Call me to discuss my specific requirements. ☐ Send me details on DBMS Seminars.

Name _____ Title _____ Company _____

Address _____ City _____ State _____ Zip _____ Telephone _____

☐ OEM ☐ System Integrator ☐ End User

Computer _____ Oper. Sys. _____

more economical. Send for the SEED DBMS Information Kit. It's yours FREE.

Or call us at (215) 568-2424. And be sure to ask for information on our FREE DBMS Seminars.

UNITED INFORMATION SERVICES, INC.

SEED SOFTWARE, 2300 Walnut Street, Suite 734, Philadelphia, PA 19103

C1114

IN DEPTH

is also a small problem. Although impact printers are impractical, dot matrix and laser-electrostatic printers are very useful. However, dot matrix printers must use a large matrix — about 21 by 27 points — and are not as fast as most other printing methods. Laser-electrostatic printers seem to be the most promising type for the Chinese language. Besides speed and flexibility to print any Chinese character, the laser-electrostatic printer is the only type that can mix Chinese and English characters at higher printing speeds.

The Chinese language can be displayed on a CRT, but there are problems. If the tube is one that accepts and displays data in fields, such as an IBM 3270, there are not enough points in a cell's matrix for printing Chinese characters.

Chinese can also be displayed on a CRT, but again, there are problems. If the tube is one that accepts and displays data in fields, such as an IBM 3270, there are not enough points in

a cell's matrix for printing Chinese characters. So the choices are to expand the size of every cell or to use more than one cell to display a character. No matter what the choice, the

result appears to be the same: A lot less information will fit on a screen.

Best Solution

Raster graphics terminals would seem to offer the best solution to the problems of display, but this type of terminal does not fit well into day-to-day operations' information systems. These systems have substantial numbers of data transactions. Raster graphics terminals are not designed for that use. Besides, Chinese graphics equipment and software are far behind the West's. The only Chinese-made graphics terminal I saw was an experimental vector machine of limited ability; all the other graphics equipment was Japanese and American.

Beyond all these problems looms the English language. Virtually every manual, technical report and significant paper on computing is printed in English. Even if the original was not, the second printing probably will be. There is a shortage of technicians in China because they must speak two or more languages. To alleviate the problem, China has assigned a large number of translators, who are ignorant in computer technology, to translate technical papers into Chinese. The problems with this approach are obvious.

The greatest setback for China's computer industry, indeed for all of China, was the Cultural Revolution. Between 1966 and 1976, while the West built a computer industry, the Chinese dismantled their high-tech industries.

While the U.S. reaped a crop of the best scientifically educated people in history, the Chinese closed many of their universities, eliminated graduate schools and persecuted professors and other intellectuals, sending them to the farmlands to be reeducated.

It was not until 1978 or 1979 that China reopened a graduate school. While the countries of the West enjoyed a relative internal peace, demonstrations notwithstanding, 20 million youths in the Red Guard ran rampant throughout China. Provided with free food, clothing and transportation by the government, they destroyed much of China's science, technology, literature, art and artifacts.

Today there is a lack of hardware and software experts that makes our shortage look like a surplus. It is another reason the Chinese are unlikely to have a substantial computer industry any time soon.

About the Author

Vaughn Jeffrey Mantor is a consultant and researcher with Computer Task Group (CTG), a nationwide software services company headquartered in Buffalo, N.Y.

Currently he is developing a large transportation application system, designing a graphics productivity aid for system development and teaching at CTG's Institute for Technical and Management Training.

UNIXTM & C

VIDEO-BASED TRAINING

PROFESSIONAL • HANDS-ON • ON-SITE • COST EFFECTIVE



The Computer Technology Group's Video-Based Training integrates professionally developed and produced video and text material, as well as hands-on exercises, into complete training programs.

Our courses are produced with the highest standards of video quality, applying the latest techniques of instructional design including the use of computer graphics and animation techniques to compress learning time. The students' time is not wasted with the "camera at the back of the classroom" or "chalk talk" approach which is so inefficient, and often ineffective, in transferring skills.

Experts in designing and implementing UNIX systems, the Computer Technology Group's course developers have taught UNIX and 'C' courses to thousands of students in live seminars. In addition, the staff has over a decade of experience in developing video-based training.

Courses are available for purchase or rental.

To order (or for course descriptions) call:
(800) 621-3155
or in Illinois (312) 987-4000

We also offer public and in-house seminars.
For further information,
please call the above number.

COMPUTER TECHNOLOGY GROUP

Telemedia, Inc.

310 S. Michigan Ave., Chicago, IL 60604

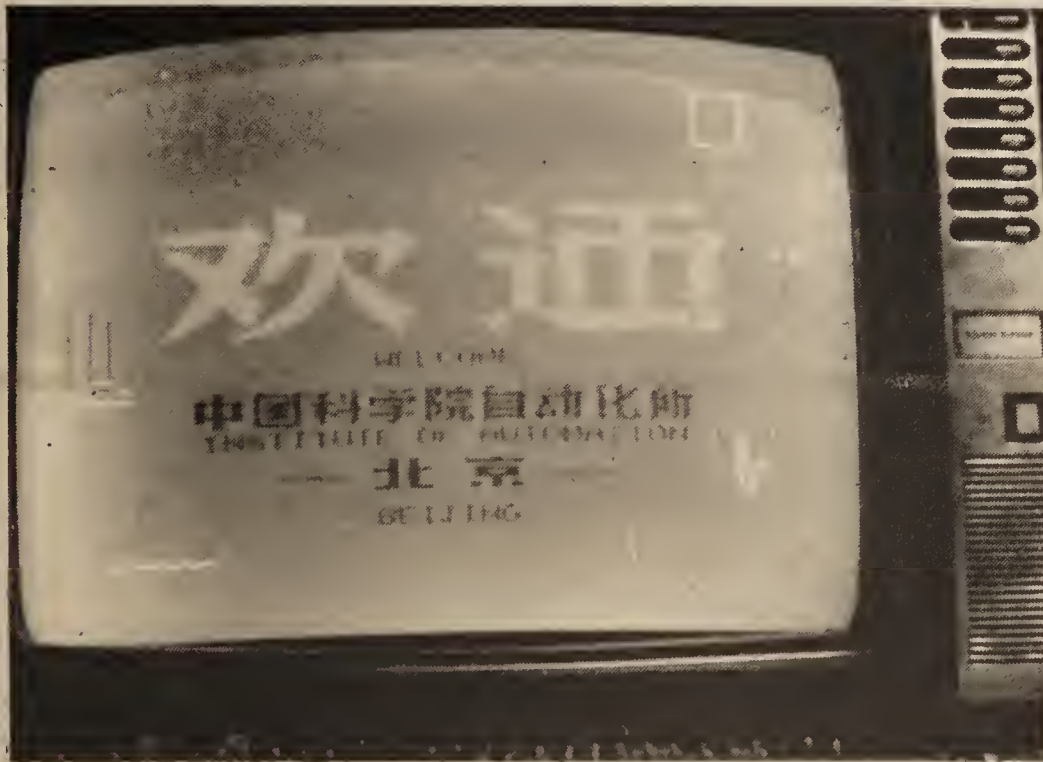
China's Goal to Build Own Computer Industry

By Chen Liwei

This article was originally prepared by China Computerworld and appears here courtesy of the CW International News Network. The author is chief engineer at the Administration of Computer Industry under the Ministry of Electronics Industry.

At the first national meeting called by the Computer and LSI Leading Group in May, Group Leader and Vice-Premier Wan Li pointed out, "If we are to quadruple the gross output value and realize the four modernizations, we must first of all build up our own computer and LSI industry." As a professional in the computer field, I feel it is our responsibility to realize this goal. But how?

The computer industry has developed at an astonishing speed in advanced countries. In the U.S., the gross national product (GNP) quadrupled between 1958 and 1978, but the value of computer hardware output rose by 40 times (50 times, if software and services are included). In 1958, the computer hardware output value in the U.S. was only .1% of the



GNP, equivalent to the present situation in China. But 20 years later, its output value represented 1% of the GNP, a growth rate 10 times higher than the GNP. If compared with the U.S. electronics industry, the com-

puter hardware annual output value jumped from 7% to 50% of the total output value in the same two decades, a growth rate seven times faster than that of the electronics industry.

In the other economically developed countries, the annual growth rate in computer industry output value averages more than 20%. Then what about China's?

At present, China has more than 300,000 industrial enterprises, a vast potential market. As the reform of management systems develops in depth, the demand for computers will inevitably become greater and greater. By 1990, several thousand backbone industrial enterprises will have installed mainframes and minicomputers. By the end of the century, this figure will rise to several dozen thousand.

If one considers the need for computers in finance, trade, commerce and administration, the number of installed mainframes and minicomputers may reach several hundred thousand. And applications of various types of microcomputers will involve huge quantities of those devices, too.

Therefore, as in other developed countries, China's computer industry will grow dozens of times in 20 years, at a speed much higher than

MORE BANG FOR YOUR BUCK.

WITH INNOVATIVE'S MC-80 PROTOCOL CONVERTER SERIES, you don't just get low cost solutions to your network compatibility problems. You get much more...

For starters, you get total technical sales support. We help configure your network and offer customized peripheral integration. Next, we assist you through your installation and continue to offer our technical support by keeping our phone lines (voice and data) open.

Our MC-80, the most versatile micro-processor based controller, allows your network to grow or change without obsolescing existing devices. It's the perfect

tie-in to inexpensive ASCII devices for mainframes with protocols such as IBM 3270 BSC, IBM 2780/3780, SNA, X.25, Burroughs, NCR and more.

In addition, on and off-line diagnostic capabilities of the MC-80 allow the user to verify proper operation and detect and isolate problems.

Isn't it time you get more bang for your buck. The MC-80 series starts at just \$1,445. For complete information call us today, toll-free 1-800-327-3955.



Innovative
network data communications



INNOVATIVE ELECTRONICS, INC. • 4714 NW 185th Street Miami, Florida 33014 • (305) 624-1844 Telex: 807121

"We contracted out.
But with a
Kodak Komstar 200
microimage processor,
we saved \$30,000
by doing it ourselves."

When a major do-it-yourself tool company needed to keep up with ever-increasing forms and records, they turned to Kodak.

Our Komstar 200 microimage processor took over the job. And saved over \$30,000 in outside costs just six months later.

Find out how Komstar equipment can help you tool up in-house, for less. Send in the coupon today. Or call toll-free: 1-800-44KODAK (1-800-445-6325), Ext. 303.



© Eastman Kodak Company, 1983

Send me the case history above and more information on the Komstar 200 microimage processor.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE (____) _____

Eastman Kodak Company
Business Systems Markets Division
Dept. DP3624, Rochester, NY 14650

IN DEPTH

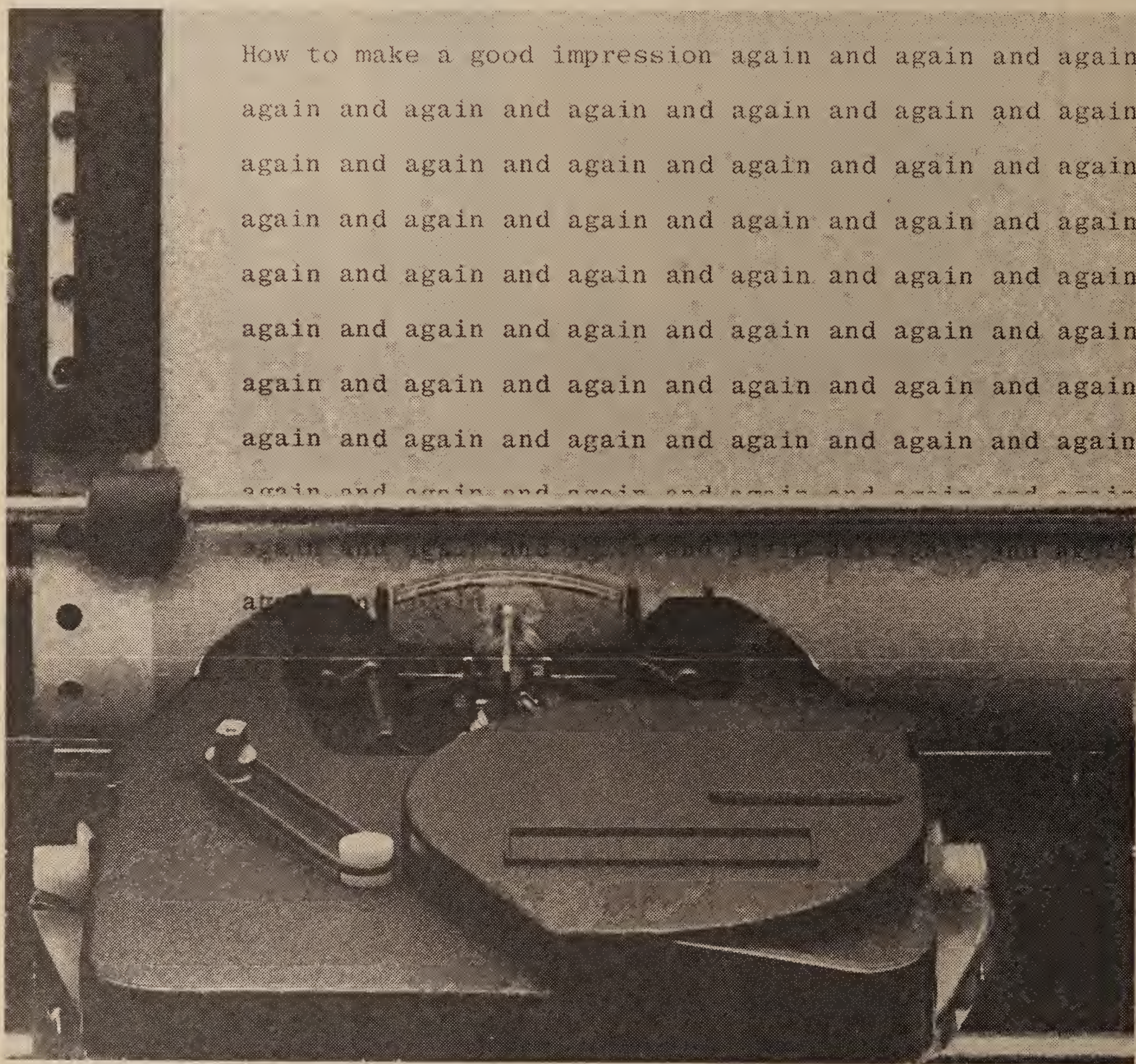
that of the gross output value of industry and agriculture. To satisfy users' needs, the computer industry must provide not only mainframes and related peripheral equipment but also system software, application software, system design and con-

sulting, maintenance and training services. All these elements come together to form a complex product — a computer system. To the end user, each element is indispensable. When an experienced user purchases a computer, he

will pick the best one after comparing price, functions and quality with other models. Therefore, China's computer industry must balance product development to meet the users' needs. At present, computer product development in China is se-

riously out of proportion. For instance, disk drives are a weak link in peripheral equipment, and maintenance services are almost nonexistent. With a balanced product base, the industry must also adjust its organizations and

personnel structure. In this system, attention should be paid to consulting, systems analysis, maintenance, personnel training, marketing and other service departments. The industry should have a massive contingent working in all walks of life. Feedback information from the field will be an important basis for decision making at the top level. In the U.S., IBM and Digital Equipment Corp. have one-third of their workers and staff members working



At present, computer product development in China is seriously out of proportion. Disk drives are a weak link in peripheral equipment, and maintenance services are almost nonexistent.

at these service departments. IBM has 100,000 people, DEC 16,000. In China, we have very few people doing the same kind of jobs. This wide gap is one reason for the slow development of our computer industry. Another weak spot in the industry is the poor management system. Most computer factories in the country are isolated and small enterprises. Each does what it thinks is right. How can such a situation suit the needs of a rapidly developing industry? It is high time that big corporations be organized to improve the management system and to speed up computer production.

You can maintain the quality of the impressions you make with a ribbon from Curtis 1000. We supply every type you can imagine, to fit almost every word processing and small computer printer as well as office typewriter. Single-strike ribbons. Long-lived multistrike film ribbons. Correctable ribbons. Colored ribbons. Ribbons to enhance the appearance of your com-



munications and improve your office productivity. Ribbons are but one of our mile-long list of products—forms, envelopes, magnetic media, letterheads, binders, and the like—that help you get the word from person to person, department to department, and company to customer. In essence, we supply things to make business work. We've been at it for more than a hundred years.

Developing Software

Application software is the key to computer industry development. Without that software, the computer is useless. Generally, computer manufacturers can supply application software, but only for general purposes. Some large-scale application software still has to be written by software personnel on the user's side. The expenses of what is called the "user's second development" usually exceed hardware expenditures, and the process takes a long time. Software personnel on the user's side are important members of the computer industry. Without their hard

1000 DIFFERENT PRODUCTS TO MAKE BUSINESS WORK

For more information, mail coupon to Curtis 1000 (CW-RIB2) 1000 Curtis Drive, Smyrna, GA 30080

Name _____ Title _____ Phone () _____ Organization _____ Street Address _____ City, State, Zip _____

working, computers could not have played miracles.

There are about half a million software workers in the U.S. About 80% of them work in user companies. This figure is much greater than the total staff and workers of IBM. In the Soviet Union, there are about 200,000 application software people working at the All-Soviet Automatic Management System (ACY). But there are only 40,000 technicians for software and hardware development of the EC series computers that serve the ACY.

These figures show that application software people are much more than product development technicians (software and hardware people together). If these people are not trained on a regular, timely basis, computer applications become merely empty talk.

To explain how many application software people China needs, I give the following example. If 5,000 information systems were to be put into use by the end of the century and each system had 40 software people, the whole country would need 200,000.

Though China has a very limited number of application software personnel for the time being, it has very rich human resources.

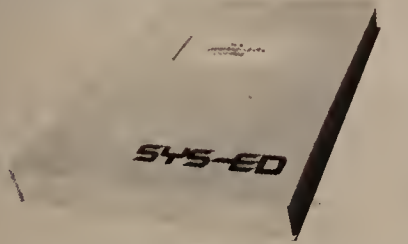
Model	Word Size (In Bits)	Memory Size	Speed (Operations per Second)	Factory
DJS-101	16	8K to 32K bytes	400,000	Huadong Teachers' University Scientific Instrument Factory
DJS-110	16	4K to 12K bytes	90,000	Changzhou Radio Factory No. 2
DJS-112	16	4K to 32K MOS	150,000	Changzhou Radio Factory No. 2 Shaoguan Radio Factory
DJS-130	16	32K bytes	500,000	Suzhou Computer Factory Weifang Computer Factory Beijing Computer Factory No. 3 And two others in Tianjin
DJS-131	16	32K bytes	500,000	Shanghai Computer Factory
DJS-132	(Upgraded DJS-131)			Tianjin Radio Technology Institute Tianjin Electric Instrument Factory Suzhou Computer Factory
DJS-135	(Same as DJS-130, temperature resistant -15°C to 45°C)			Tianjin Radio Factory No. 2 Yunnan Electric Equipment Factory
DJS-140	16	64K to 128K	800,000	Beijing Computer Factory No. 3 Jinzhou Computer Factory
DJS-142	16	.5M bytes		Jinzhou Computer Factory
DJS-153	16	32K to 128K MOS	1-1.4 million	Tianjin Radio Technology Institute No. 785 Factory Suzhou and Weifang Computer Factories
DJS-154	16	32K bytes	200,000	No. 738 Factory, Dalian Radio Factory
DJS-183	16	28K bytes	500,000	No. 830 Factory, Hubei Radio Factory
DJS-184	16	32K to 128K	400,000- 500,000	No. 1915 Institute
DJS-185	16	32K to 124K	500,000	Shanghai Computer Factory
DJS-186	16	16K to 128K MOS	1 million	No. 1915 Institute

Minicomputer Models Manufactured by Chinese Factories

NOT ALL CICS AND VSAM COURSES ARE ALIKE.

OUR HANDS-ON VS. THEIR HANDS-ON.

SysEd students spend fully one third of class time in actual hands-on workshop sessions with our IBM 4341/II—unlike some courses where you're lucky if you even see a computer. Under the guidance of our highly qualified instructors, our students work at their own terminals, coding and running real life programs—not oversimplified "sample programs". With our limited class size, all students receive the individual attention they need, and can bring in programming assignments, debugging or design problems to the workshop sessions.



WE WROTE THE BOOK.
SysEd course manuals are the best in the industry. They are comprehensive guides and programming models written especially for each course by our experienced instructors. They are thorough, clear, and well organized, and serve as desk-top references long after the course. Our manuals are constantly updated to include new versions and more efficient programming methods.

ALL OUR TEACHERS ARE TEACHERS.
All SysEd instructors combine academic skills with broad practical experience in the business environment. They know

programming, and they know how to teach it. In the classroom, they teach not only "how to", but "why", building a solid foundation in fundamentals and insights into advanced materials. Because teaching is a full-time commitment, there are no part-time instructors on our staff. When they're not in the classroom, they're busy writing or updating course manuals, improving techniques, even developing new courses. And they're available to students after the course for additional advice or support.

TEACHING IS OUR ONLY BUSINESS.
Most computer training companies are divisions of large software companies or service bureaus. Not SysEd. Our only goal is to provide top-quality computer training for highly motivated professionals—no more and no less. Because we're independent, we're free to concentrate on teaching—and we do it very well.

OUR PLACE OR YOURS?
SysEd's courses are held weekly and on weekends at our modern, fully-equipped computer centers in New York City, Chicago and San Francisco. Or, if you prefer, we'll arrange on-site courses at your own computer installation. On-site courses can include the same case studies and hands-on approach as our public courses, or can be customized to your particular application or project. SysEd courses include CICS Command Level, Macro Level, Internals, Application Design, Performance Design and VSAM.

Classes are limited. For early enrollment or more information call Dave Shapiro (212) 889-3386.



ONE PARK AVENUE, NEW YORK, NY 10016 • (212) 889-3386

The shortage of application software people could be solved by teaching computer applications in colleges and training staff technicians in a planned way.

From a long-term point of view, the computer industry will take over more and more of the development of large-scale application software now done mostly by the users themselves. As a result, the software industry will gradually take shape; and the users' second development will gradually decrease.

The computer will eventually appear to users as an almost wholly "complex" product.

In China, some end users have

worked to develop application software. They should be encouraged. However, as there is not yet a way to evaluate software and no copyright law to protect it, their work has not been rewarded properly and their initiative is dampened. The state must work out a law to protect software products and find a way for software evaluation. Otherwise, the software industry can never be developed.

Putting Reputation First

When a user buys a computer, he means to use it to solve problems in his work and achieve economical results. If the computer breaks down

BRYCE'S LAWS ON INFORMATION SYSTEMS

"The first on-line, real-time, interactive data base system was double entry bookkeeping which was invented by the merchants of Venice in 1200 A.D."

This is one of the laws embodied in the "PRIDE"-Automated Systems Design Methodology. "PRIDE"-ASDM is an integrated and automated approach for engineering and manufacturing Information Systems. It is a straightforward business approach that is governed by the inherent principles of systems design & development. For more information on "PRIDE"-ASDM and a free poster on "Bryce's Laws", write:



m. bryce & associates, inc.
1248 Springfield Pike • Cincinnati, Ohio 45215
Tel: 513/761-8400

"Software For the Finest Computer-The Mind."

SAS... Power and Flex to Meet All Your

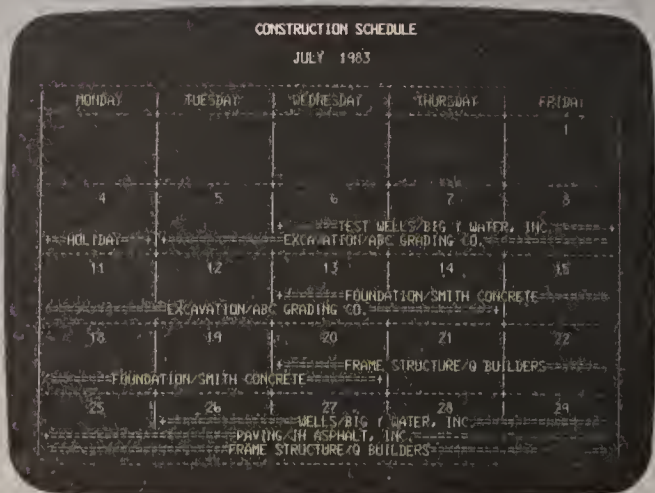
If you're looking for one software system to meet all your needs, join the over 6000 businesses, government agencies and educational sites where SAS products are used everyday.



SAS/GRAPH

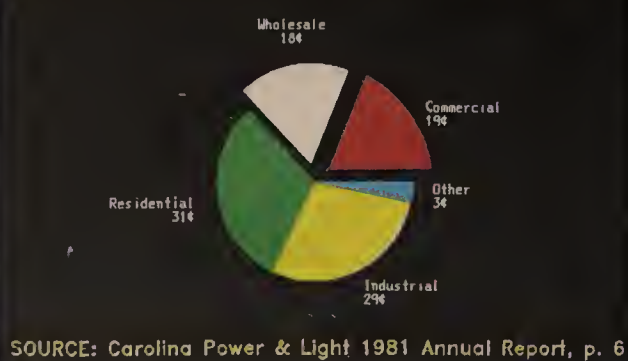
SAS products provide an integrated system for:

- data management, statistical analysis and report writing—SAS®
- color graphics—SAS/GRAPH™
- econometric forecasting, modeling and row-and-column financial reporting—SAS/ETS™
- full screen data entry, editing, letter writing and spreadsheet financial reporting—SAS/FSP™
- interface to IMS/VS or CICS DL/I data bases—SAS/IMS-DL/I™
- operations research tools for business planning and scheduling—SAS/OR™



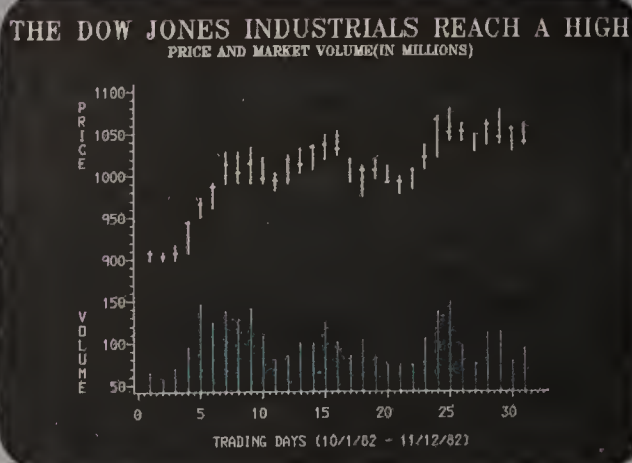
SAS/OR

Operating Revenue Dollar



SAS/GRAPH

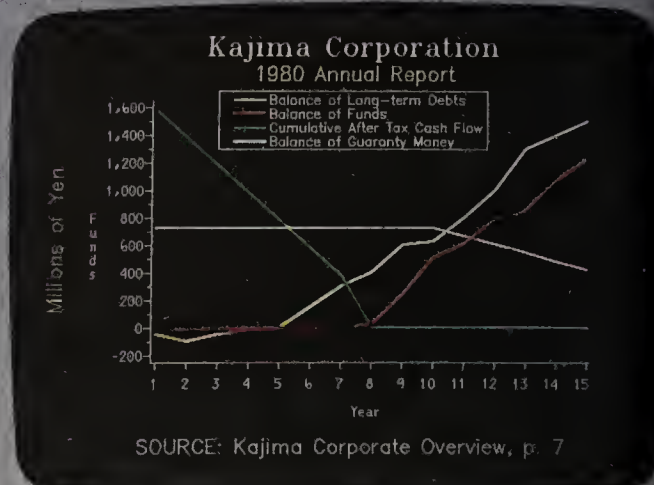
With the SAS System you get the power to handle all your needs quickly and efficiently. Plus you get a flexible system that can grow as your needs grow and change.



SAS/GRAPH

You get a twofold advantage with the SAS System. A library of ready-to-use procedures gives you the power to analyze data without formal training. SAS even provides an on-line help facility. Or you can create your own help program. With a few English-like commands, you can use SAS for data analysis, market research, capacity planning, financial reports, summary statistics, charts, plots, personnel reports and many other jobs.

In addition to these routine tasks, the SAS System handles your complicated programming needs. Extensive data management and retrieval tools, combined with a sophisticated macro facility, allow your decision support staff to create and store complex SAS jobs. You can invoke these programs with one command, giving you easy access to the data today that will help you make important business decisions for tomorrow.



SAS/GRAPH

In short, the SAS System gives you the analytical tools for a complete Decision Support System—integrating modeling, statistical manipulation, graphics and multiple data sources.

TAB SPORTING GOODS
PRO FORMA INCOME STATEMENT FOR YEAR TO DATE

	JAN83	FEB83	MAR83	TOTAL
GROSS SALES	267,083	288,186	276,906	832,175
LESS RETURNS AND DISCOUNTS	19,453	18,324	16,300	54,077
NET SALES	267,630	269,862	260,106	797,598
TOTAL COST OF SALES	125,500	123,200	127,750	376,450
GROSS PROFIT	142,130	146,662	132,356	421,148
OPERATING EXPENSES	82,350	83,510	85,445	251,305
OPERATING INCOME	59,780	63,152	46,911	169,843
OTHER INCOME/EXPENSE	500	250	1,200	1,950
TAXABLE INCOME	60,280	63,402	48,111	171,793
INCOME TAXES	24,600	25,250	19,200	69,050
NET INCOME	35,680	38,152	28,911	102,743

SAS/ETS

Available
for
IBM, DG ECLIPSE
and DEC VAX

Flexibility for Your Needs



SAS/GRAPH

When you lease the SAS System, you don't get a static product. You get a system that grows and changes as your needs grow and change. Originally supported only on IBM 370/30xx/43xx under OS and TSO, SAS products currently run under OS, DOS/VSE and SSX in batch, and interactively under TSO, VM/CMS and ICCF.

ACE BREWERY SALES
FIRST QUARTER AND YEAR TO DATE
FOR 1983

CITY: RALEIGH

BEER TYPE	MONTH			YEAR TO DATE	
	JAN	FEB	MAR	TOTAL	AVERAGE
LOW-CAL	12176.24	15378.81	13587.11	41142.16	13714.05
DARK	19321.54	18437.93	21040.50	58800.97	19600.32
PREMIUM	24217.94	21015.18	19872.62	65105.74	21701.91
ORIGINAL	31027.43	31234.99	32495.06	94757.54	31585.85
ALL BRANDS	86743.21	86066.91	87095.29	259905.41	86635.14

SAS

What's more, the SAS System now runs on Digital Equipment Corporation's VAX™ 11/7xx series.

You get the same benefits of the SAS System on minis as on mainframes. To see for yourself, take advantage of our free trial.

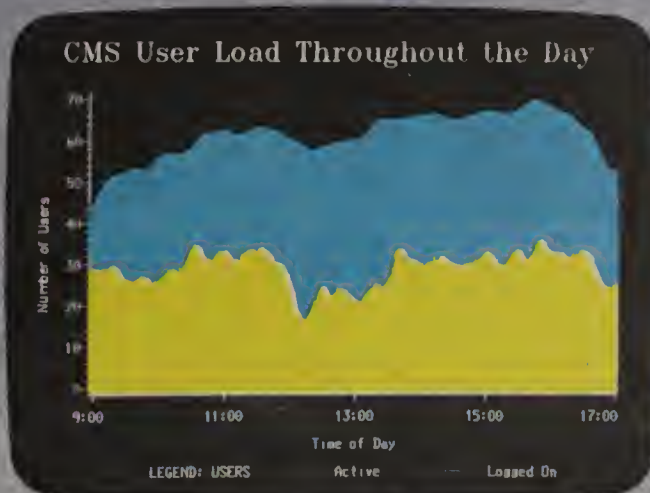
First Quarter (1983) Analysis Fiscal SSS Screen

Command ==> _

-----DEF MODE

	JAN83	FEB83	MAR83	QTR1	PERCENT
Units Sold(all products combined)					
USA	50	250	100	400	50.00
Europe	10	50	20	80	10.00
Asia	40	200	80	320	40.00
Total Units	100	500	200	800	100.00
Sales (all products combined)					
USA	655	250	1310	2215	51.85
Europe	101	35	202	338	7.51
Asia	540	100	1075	1715	40.24
Total Sales	\$1.2M	\$385	\$2.591	\$4.272	100.00
Operating Costs					
USA	225	1125	450	1800	72.73
Europe	35	80	70	185	7.47
Asia	160	19	320	499	19.80
Total Over Cost	\$420	\$1,215	\$840	\$2,475	100.00

SAS/FSP



SAS/GRAPH

But that's not all. Our continuing development efforts are backed by a complete library of user documentation, a comprehensive training curriculum, a full-time technical support staff and an international users group.

In fact, users have ranked SAS in Datapro Research Corp.'s Top Rated Group for the past seven years. In the latest survey, SAS was one of the only two software packages to receive the honor.

The best in software and service. At a price you can afford.

Call today for SAS—power and flexibility to meet all your needs. SAS Institute Inc., SAS Circle, Box 8000, Cary, NC 27511 USA. Telephone (919) 467-8000. Telex 802505.

SAS Institute GmbH, Rohrbacher Strasse 22, D-6900 Heidelberg 1, West Germany. Telephone 06221-29014. Telex 461581.

SAS Software Limited, The Centre, 68 High Street, Weybridge, Surrey KT13 8BL, UK. Telephone 0932-55855. Telex 946138.

SAS Institute (NZ) Ltd., Level 9, Greenock House, 39 The Terrace, PO Box 10-109, Wellington, New Zealand. Telephone (04) 727-595. Telex NZ 31525.

SAS Software Pty. Ltd., Level 60, MLC Center, 19-29 Martin Place, GPO Box 4345, Sydney, NSW 2001, Australia. Telephone (02) 235-2199. Telex AA 71499.

SAS System prospect letter

January 17, 1983

Mr. Scott M. Kelly
Thomas Wholesale Distributors
1200 East Industrial Drive
La Grange Park, IL 60525

Dear Mr. Kelly:

Thank you for your interest in SAS. The information you requested is being sent to you.

Flexibility--SAS provides data retrieval, programming, statistical, and reporting capabilities.

Power--Easy-to-use SAS procedures produce results quickly, while a full complement of programming tools satisfies programmers' requirements.

SAS users can take advantage of several additional products. You only need one system to graph color displays with SAS/GRAPH, to produce forecasts and financial reports with SAS/FSP, to access IMS/DB data bases with SAS/IML, and to plan your business projects with SAS/OR. We offer a wide range of training courses and documentation to support our products.

You'll find SAS cost effective. It dramatically increases productivity without stretching software budgets.

Please call me if you have any questions about SAS products and services. I will be happy to discuss your specific requirements.

Sincerely,
SAS Marketing Representative

SAS Institute Inc.
Box 8000
Cary, NC 27511
Phone (919) 467-8000

SAS/FSP

SAS



SAS®
saves
time.

IN DEPTH

and cannot be repaired within minutes, routine work has to stop and the user suffers heavy losses. Every one of us in the computer field must have a clear understanding of such consequences. Our products should have good quality, reasonable price and backup services. "Reputation" means making users completely satisfied.

Building up reputation is easier said than done. Though some computer factories in China have begun to do so, homemade [domestic] computers in general are not of high rep-

The state has worked out some policies to restrict importation and protect domestic industries. But these policies need improvement. The state should also formulate a plan concerning the development of technologies so that the computer industry can grow according to social needs.

utation. At present, especially when some computer products have lost their reputation in one way or an-

other, doing one or two good things can by no means redeem one's reputation. Only by doing thousands of

good things in a period of several years can a factory redeem and build up its own reputation.

Therefore, the computer industry should put a high priority on building up its reputation and should treat that reputation as a lifeline. Without it, there will be no computer industry for China.

As an integral part of the national economy, China's computer industry must develop proportionately, in a planned way. But what is meant by "in a planned way"?

Usually it takes three to four years to develop a medium-size system or minicomputer. While the product is being prepared, production lines must be set up and industrial production capacities determined. Personnel must be trained to work at maintenance service centers to be built throughout the country. This process requires a huge investment. The cost to put a new model into production might reach tens of millions of dollars, or five to seven times more than the development expenses.

After a new model is put into production, it should be manufactured for a certain period (say five years) and sold in certain numbers (say 1,000 sets). Otherwise, the investment will not be able to return profits. After that certain period, the system should be replaced by another more advanced model. This is what "in a planned way" means.

Such ideas actually are quite common knowledge. But in reality, they are not so easy to be carried out. For instance, we are developing and trial-producing a new computer model equivalent to the international level of the late 1970s and early 1980s. In three or four years, it will be put into production. But computer technology advances very rapidly in the world. By the time the new model is ready for volume production, some more advanced foreign-made models with better cost/performance will have already entered the Chinese market. They will inevitably have a strong impact on the domestic model. The very existence of the computer factory will be threatened and the production plan seriously affected.

This situation is not a hypothesis. As a matter of fact, some Chinese factories that have undertaken to develop new models are sitting under the sword of Damocles. How can they have the resolve and courage to put in more financial and human resources for mass production and backup services? Such a new model might well come to a premature end. Even if it did go into operation, it may not be manufactured on a mass scale. The price might be too high, quality too low and maintenance services unprepared. What a worrying picture this is!

However, we should not be that pessimistic. True, China's computer industry is still young and lacks competitive ability. The state has worked out some policies to restrict importation and protect domestic industries. But these policies need further improvement.

WHEN YOU'RE READY OUR PC PLUS™ KIT WILL BE WAITING



10mb Internal Upgrade

When you're ready to boost your storage capacity from 640K to 10mb without boosting power and without eating up desk-top space, our internal **PC PLUS™** will be just a phone call away.

Waiting to give you all the capacity of the *XT at a price that saves you hundreds of dollars compared to the cost of trading up.

The DSS™ **PC PLUS™** kit uses a half-height 10mb Winchester disk drive that gives you all the benefits of Winchester technology — increased data integrity,

faster access — without taxing the power supply. The *DataMark® HFC controller is a single board solution. It is inserted over the half-height Winchester disk drive. And it is totally IBM formatted.

The DSS™ **PC PLUS™** kit presents the storage solution you need now. What are your data storage needs? At DSS™, we do much more than sell components. We create solutions.

The DSS™ **PC PLUS™** kit includes:

- 10mb half-height disk drive
- DataMark™ HFC controller
- Full height front bezel
- Mounting hardware
- Cables

Features and Benefits

- Increased capacity
- Increased access time
- Upgradeability
- No additional power requirements
- Enhanced cooling
- One board controller solution
- Operates with 1.25 MS-DOS through 2.0 MS-DOS
- Internal upgrade
- 1 10mb half-height Winchester=31 floppy's
- Increased data integrity

Retail price: \$2250
from the dealer nearest you

See us at
COMDEX/Fall '83
November 28-December 2, 1983
Las Vegas Convention Center
Las Vegas, Nevada

DSS

2907 N. 55th St., No. 5 Boulder, Colorado 80301 303/449-7587 Toll Free: 800-851-PLUS
Data Storage Solutions, Inc.

*XT is a registered IBM trademark

*DataMark is a registered trademark of Memorex

The genius of Team Xerox.

XEROX

XEROX® and 8010® are trademarks of XEROX CORPORATION.



The 8010 professional workstation has always been known as a computer of dazzling capabilities, especially in its graphics, information processing and document preparation.

Team Xerox But what some people may not know is that the 8010 is also the key element in Team Xerox, a system of office machines designed to work together like a team.

When part of an Ethernet network, the 8010 can work with a wide array of word processors, mainframes, personal and business computers, printers, electronic mail and file services, facsimile terminals, communicating Memorywriters, other networks and, of course, other 8010's. It also provides 3270 and TTY emulation.

Its full 17" bit-mapped screen lets you view two full pages simultaneously and open up to six documents at a time without covering up a previous document.

It's also the only workstation that can create and print documents in more than a dozen languages, including Russian and, for the first time, Japanese (Katakana, Hiragana and Kanji).

While other workstations may use Xerox innovations like the mouse, icons, windows, property sheets and combined text and graphics, the 8010 simply does more with them.

For example, the 8010's extensive software is fully integrated, to allow you to work with text and graphics simultaneously. You can draw a flowchart right in the middle of a full page of text without

having to resort to a separate program and limited buffer "scratchpad" or "clipboard."

In terms of capabilities, ease of use and overall value, the 8010 would have to be considered the stellar workstation in the industry.

For more information, call 800-527-1922 (in Texas, 800-442-0152), or send in the coupon. Or ask anyone who's ever used the 8010.

Xerox Corp., Box 470065, Dallas, Texas 75247.

☐ Please have a sales representative contact me.

☐ Please send me more information.

Name _____ Title _____

Company _____

Address _____ City _____

State _____ Zip _____ Phone _____

IN DEPTH

The state should also formulate a series of policies concerning the development of technologies so that the computer industry can grow according to social needs and based on a state plan. Such policies would greatly encourage factories to manufac-

ture new models on a trial basis and would protect them from outside disturbance. They could become fully confident so that they could invest more financial and human resources in developing new computer models.

With such a program, there should be no problem of guaranteeing the quality, forming capabilities for mass production, training a maintenance force and setting up service centers. Consequently, users would be satisfied, product reputation built

(though gradually), the national computer healthily developed and the four modernizations in China sped up. What a bright future that will be!

Over the past few years, China's minicomputer output has dropped markedly

because of the powerful impact of imported minicomputers. Some computer manufacturing factories suddenly found themselves in a tight corner — though temporarily, in most cases. Nevertheless, the total number of Chinese-made minicomputers installed over the same period has been increasing.

This fact shows China still has a potential market for minicomputers. There is a bright future for domestic manufacturers if they can turn out minicomputers with reliable quality and good cost/performance.

At present, Chinese minicomputers (especially the DJS-100 series) have an average mean time between failures (MTBF) of more than 1,000 hours. This is a big stride forward in stability and reliability. When DJS-130 came into being in 1974, its MTBF was only 50 hours. That figure jumped to 500 hours in 1980. Now some DJS-130s have an improved MTBF of 2,000 hours.

Meanwhile, the minicomputers China has imported from abroad are not without problems. There are 22 DEC PDP-11/34s being used in east China. A total of 128 malfunctions were recorded in two years. Some machines had several malfunctions in a row.

Spare parts are also a serious problem in maintaining the imported minicomputers. One PDP-11/34 had to stop working just because of the damage to a safety device — no spare parts were available. This problem does not exist with homemade computers.

Among the minicomputer models manufactured in China, DJS-153, 142, 185 and 186 have reached the middle and high-end levels of similar models made abroad. Their hardware and software functions are not second to that of the PDP-11/34. S-16, a new model soon to be put on the market, has further raised the quality and reliability of Chinese-manufactured minicomputers to a new high.

There is the possibility that China's minicomputer manufacturers could catch up with advanced world levels if they fully utilize their own strong points and learn advanced computer technology from abroad. Supported by correct policies from the state, they might recapture the minicomputer market in China in the long run.

Stack the results in your favor with NEC modems.

Unsurpassed reliability. State-of-the-art technology. That's what you can count on with NEC modems — and for some very special reasons.

NEC is a major modem manufacturer. But we're also one of the world's leading, most diversified manufacturers of products that use modems. Telecommunications. Data communications. Computers. Facsimile, plus more. So we know from experience what works best.

NEC Central Research Laboratories constantly feed us dynamic new ideas and concepts, too, so we stay on the leading edge of modern technology. Our compact high-speed modems and auto-dial/auto-logon modem are the most advanced and economical of their type. And our broad product line includes total Bell System compatibility from 300 to 2400 bps.

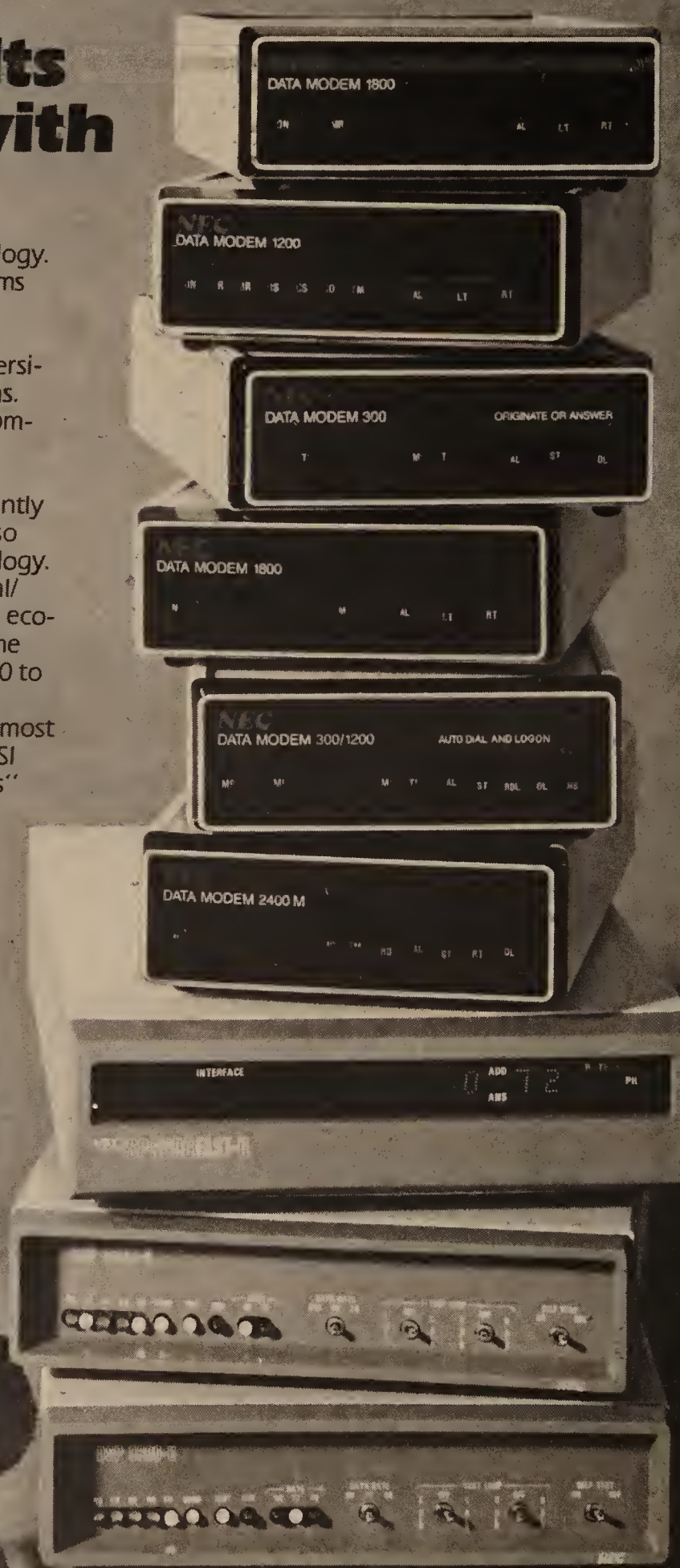
NEC reliability comes from manufacturing most of our own components, including our own VLSI microcomputers. Combined with "Zero Defects" quality control, this helps our modems achieve a MTBF in excess of 9 years.

Our nationwide distributor network backs you with local support. And for direct technical assistance, we furnish a 24-hour toll-free number you can call.

Stack the results in your favor by contacting us at 1012 Stewart Drive, Sunnyvale, California 94086 (408) 737-7711, or (800) 538-8166.

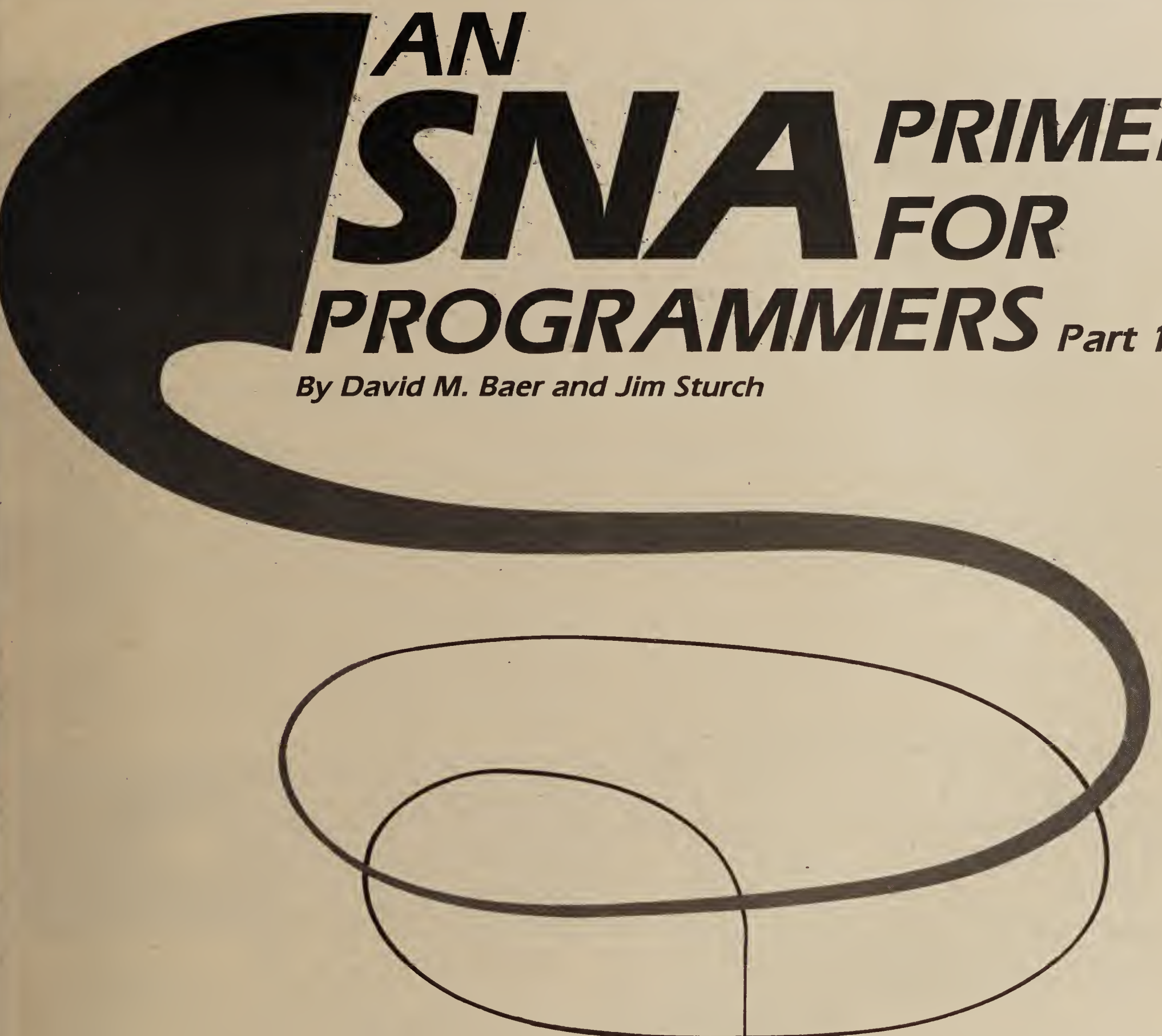
Data Communications Products

NEC NEC America, Inc.



AN SNA PRIMER FOR PROGRAMMERS *Part 1*

By David M. Baer and Jim Sturch



The programmer/analyst and the communications specialist often speak different languages. After all, to the typical programmer, "able baker" could easily designate an individual capable of producing a credible croissant, while asking a person involved with communications to "scratch a data set" might be interpreted as a request to vandalize telephone company property.

It is not surprising, therefore, that a programmer frequently meets with failure when he attempts to improve his knowledge of the IBM environment by learning something about Systems Network Architecture (SNA). Most written material on the subject originates with people whose primary expertise is communications.

With this basic problem in mind, we offer a "grass-roots" overview of SNA as

an introduction for those who do not speak the language of communications specialists.

This discussion is intended for the programmer who would like a general explanation of how information flows between points in an SNA network, for the potentially serious student who needs a starting point for a more extensive education and for the project manager who would like to be able to look systems programmers straight in the eye, even as they speak of NCPs, NCCFs and NPDAs.

SNA did not burst upon the scene fully developed; the technology's power and flexibility have expanded continually since its introduction in 1974. It is educational to follow that evolution to understand not only what the various SNA hardware and program products

IN DEPTH

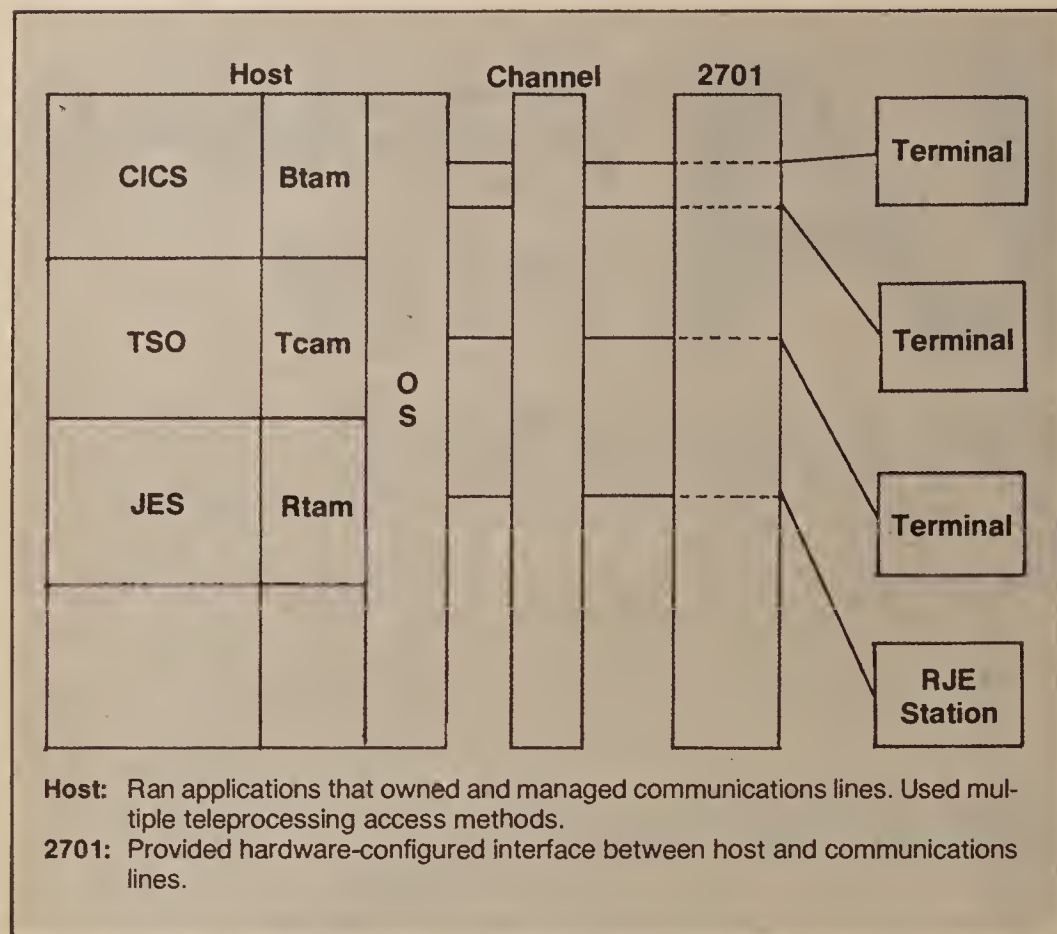


Figure 1. Pre-3705 Networks

are, but also their reasons for being.

In the early '60s to early '70s, before the first release of SNA products, a typical environment would have been similar to the one shown

in Figure 1. The host computer, a 360 or later a 370, ran applications that owned communications lines, which were assigned a unique and fixed subchannel. A terminal connected to

TSO, for instance, was owned by TSO and could not access any other application. The lines also used a predetermined protocol that dictated the type of terminal required.

This inflexibility resulted in wasted potential network resources and unnecessarily high communications costs. Finally, no capability existed for host-to-host communications; the structure was strictly limited to a master/slaves relationship.

Within the hosts, applications would accomplish network communications using one of several telecommunications access methods. As Figure 1 illustrates, TSO used Tcam, CICS and IMS generally called upon the services of Btam and JES used a less familiar access method, Rtam. None of these access methods were compatible, however. For instance, TSO could not communicate via Btam. Clearly, a universal telecommunications access method was needed to permit flexible network utilization, as well as to provide a standardized foundation upon which to base future telecommunications program products.

Devices in communication with the host could be connected directly to the channel or could interface to a front-end communications controller, the 2701. The 2701 was a nonpro-

grammable, hardware-configured device; hardware modifications were required to change the interface.

Enter the 3705

A new communications controller, the 3705, was introduced in 1972. While it was later to become one of the cornerstones in the SNA hardware product line, its initial function was to replace the 2701. Though it performed the same network role, it offered more attractive price/performance characteristics and, more significant, it was programmable. This feature allowed it to function as a 2701 look-alike by employing an emulation program; it also allowed network modifications to be introduced far more easily. However, a more important aspect of the 3705 was that it set the stage for the introduction of the first true SNA networks.

In 1975, IBM introduced two major program products and compatible hardware in the 3270 product line that supported an approach to network management dramatically different from the one preceding it. An example of an initial SNA configuration is illustrated in Figure 2.

In the host, a universal telecommunications access method was provided which ran in its own partition. The Virtual Telecommunications Ac-

FREE HARDWARE!

IBM PC AND PC XT OWNERS

ACT NOW!



Now, when you purchase our 3780 emulator for only \$599, you will receive a full featured 2780 emulator and a dual channel synchronous communications adapter board — **ABSOLUTELY FREE!**

Your free hardware features two RS-232 channels (software selectable) based on the newest communications chip (Z8530) technology and requires only one slot in your IBM PC or PC XT system.

However, this extraordinary offer is available for a limited time only, **SO YOU MUST ACT NOW!**

THE SDI SERVICE GUARANTEE

At SDI, we design quality into all of our products to prevent any costly disruption of your business. If a problem ever arises with one of our products, you are guaranteed our immediate attention. We also offer free update service. Solutions are never far away when service is available from 9 a.m. to 9 p.m., seven days a week.

ABOUT THE SOFTWARE

- SDI2780 emulates all features and functions of the IBM 2780 RJE Workstation with the exception of Six-Bit Transcode, Synchronous Clock Feature and Off-Line operation.
- SDI3780 emulates all features and functions of the IBM 3780 RJE Workstation with the exception of Home Mode and On-line Test Mode.
- SDI3274 (1st quarter '84 availability) a network based product which emulates all features and functions of the IBM 3274-51C (BISYNC version) with attached 3278 Display and 3287 Printer.
- Hardware transparency allows our emulators to operate with our hardware, the IBM Binary Synchronous Communications Adapter or the AST CC-232/332 adapters.
- Major features of the RJE emulators include: point-to-point, multipoint, up to 9600 BPS, single file/single message or multiple concatenated file transmission, command/status logging, total unattended operation via diskette resident batch command files, color monitor support, data and program file transfer between PC's, normal and transparent file transfer between PC and Host computer, user friendly, help function, constant display of transmitted/received data if desired, command menu present at all times, hardware diagnostics, error statistics, I/O overlapped with communication line activity for maximum throughput and many more features too numerous to mention.



Software Dynamics Incorporated of Florida
P.O. Box 247, Dunedin, Florida 34298-0247
(813) 733-8784

Zip up your address files for ZIP + 4 savings



Introducing EZ-9 and EZ-5 from COM-MAIL. EZ-9 is a system that assigns the approved U.S. Postal Service ZIP + 4 code for extra discounts. It runs on any IBM/IBM-compatible mainframe computer or Univac 80/90 series computer. And for 5-digit ZIP codes, EZ-5 verifies, corrects or adds the current 5 digits to your files. Both products are easily installed, parameter driven. Use separately or as a complementary system.

Install EZ-9 and EZ-5 to:

- add more ZIP to your address files
- add more capability to your mail program
- add more bottom line savings

COMNET®

COMPUTER NETWORK CORPORATION
Software Products Division, Dept. CW463
5185 MacArthur Boulevard
Washington, D.C. 20016

Call toll-free now at (800) 368-5806 or locally at (202) 537-7281. Or unzip and mail this coupon today.

Yes! I want to ZIP up my address files.
☐ Send me more information.
☐ Call me to set up a presentation.
☐ Send information on other COM-MAIL products.

Name
Title
Address
City
State ZIP
Phone

IN DEPTH

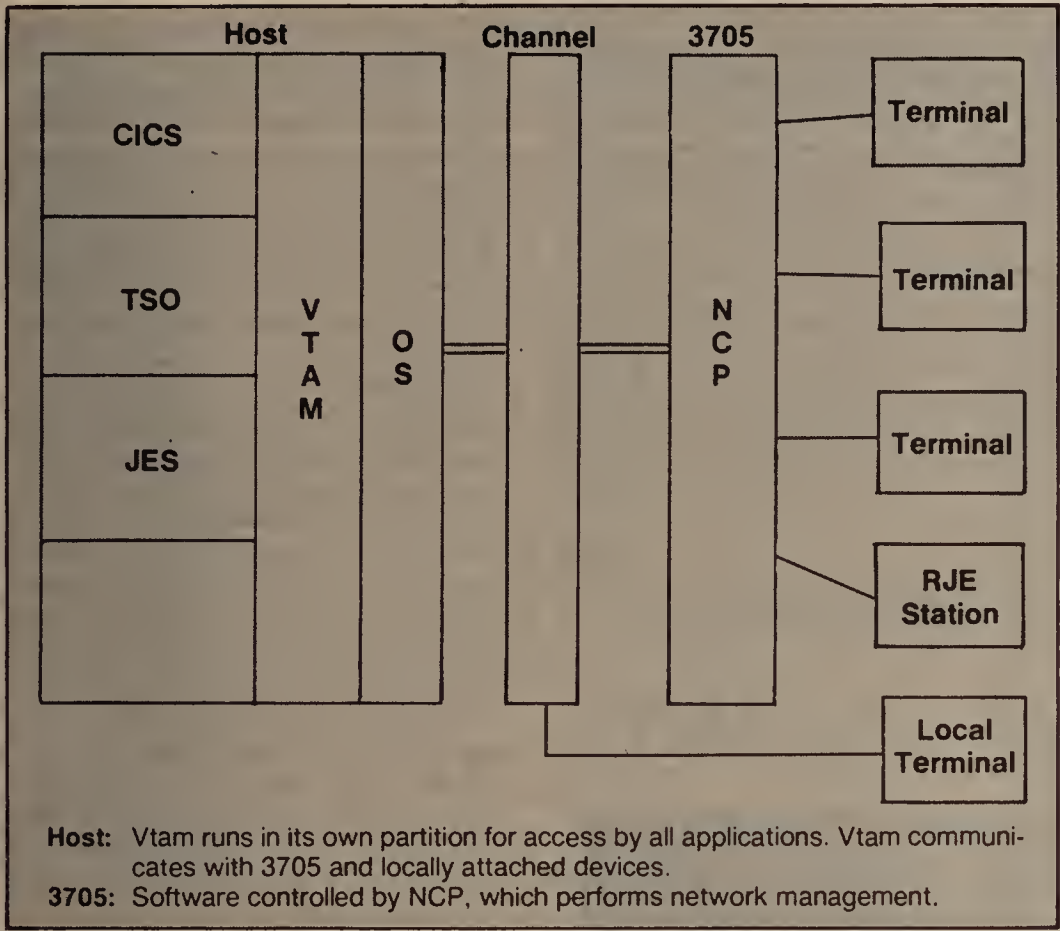
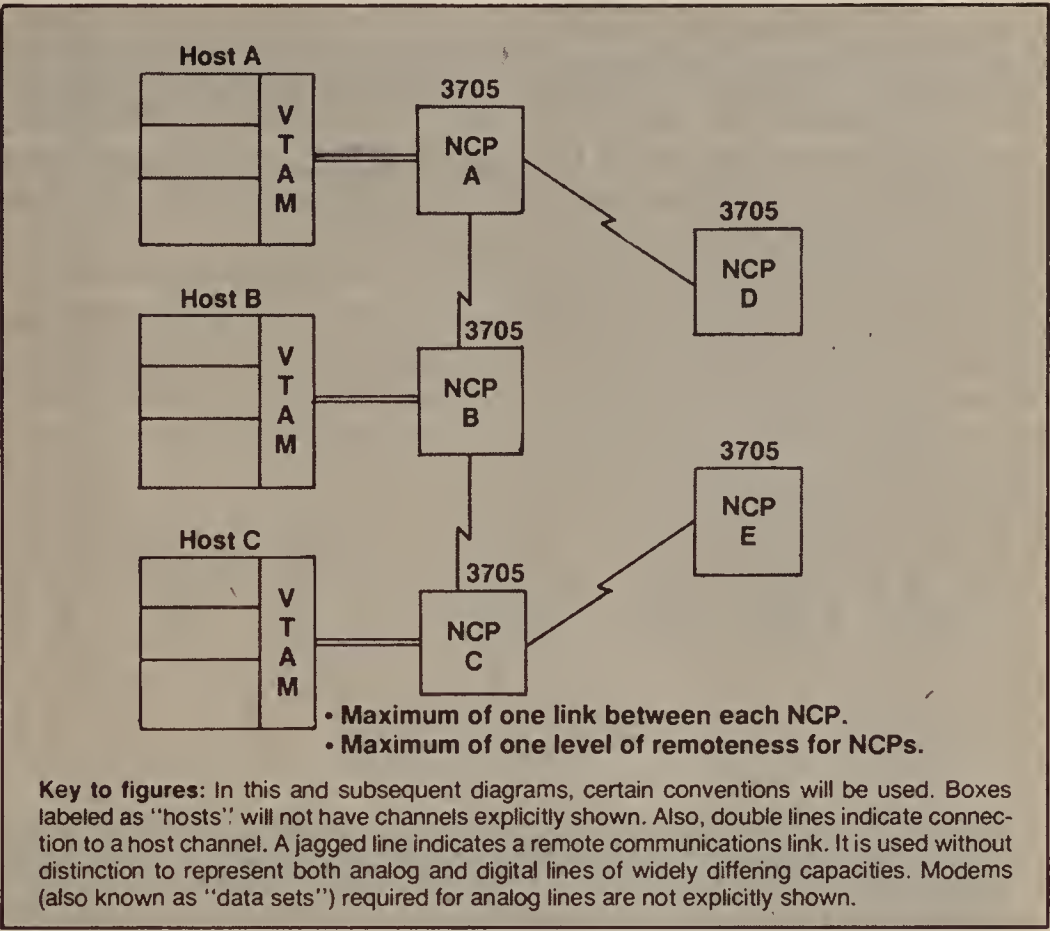


Figure 2. Vtam/NCP Networks

cess Method (Vtam) was available to all application subsystems such as TSO, IMS and CICS to receive and direct network messages to locally attached terminals, 3705s and other ap-

plications within the same host. Vtam provided the additional benefit of being able to supply a level of communications error recovery above that of the application.



Key to figures: In this and subsequent diagrams, certain conventions will be used. Boxes labeled as "hosts" will not have channels explicitly shown. Also, double lines indicate connection to a host channel. A jagged line indicates a remote communications link. It is used without distinction to represent both analog and digital lines of widely differing capacities. Modems (also known as "data sets") required for analog lines are not explicitly shown.

Also significant was the fact that Vtam owned all the resources of the network, which permitted a degree of network flexibility previously unachievable; the applications no longer owned the communications lines they used. This meant that a single terminal on a fixed line could now be used to communicate with a variety of applications.

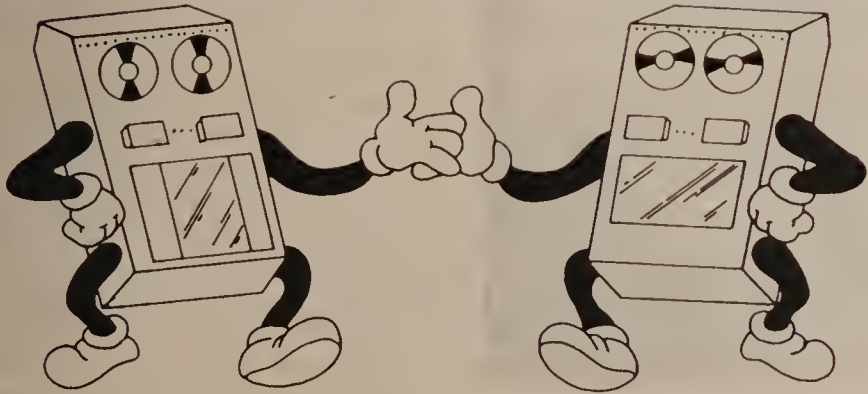
A Vtam-compatible software package was introduced at the same time to run in the 3705. The Network Control Program (NCP) provided additional support for the networking environment. It allowed communications with Vtam using only a single subchannel between the 3705 and

the host. It assumed additional network management responsibilities such as polling, which previously had been accomplished by the host. It also supplied another level of error recovery between the application and the devices in communication with it.

There were problems of stability in the early SNA networks, as might be expected of any new, highly complex technology. There were also limitations: The network was essentially still limited to a master/slaves configuration, and multiple hosts could be integrated into a single network only with great difficulty.

These problems and others were

OUR SWITCHES MAKE YOUR IBM SYSTEMS WORK LIKE A TEAM!



If you have more than one IBM or plug compatible processor, Digital can help you get the most for your hardware investment. Our switches allow you to achieve backup and peripheral configuration flexibility at a fraction of the cost you're probably thinking.

Whether you have two processors or more, Digital has a switch to suit your requirements.

- Model 4101 The lowest priced matrix switch on the market.
- Model 3421 The only manually operated channel switch in the industry.
- Model 3403 A remote controlled channel switch designed for underfloor installation.

DIGITAL CONTROLS

2779 Orchard Run Road • Dayton, Ohio 45449 U.S.A. • (513) 435-5455
Dallas 214-669-0089 New York 201-585-9416

*Registered Trademark



TSO USERS
Poor Response Time?
High Paging Rates?
Improve your TSO
performance
with FSE+™

Compare these features:

- Up to 50% less overhead than SPF
- Full-Screen Editor (LRECL up to 4096)
- Data Set Manager (Controls TSO files)
- JES Sysout Previewer (Direct from JES Spool)
- File listing facility (LRECL up to 32760)
- Programmable function keys
- Split-Screen facility (Two fully-active screens)
- Customer-defined exit facility (Controls all FSE+ functions)
- FSE+ tuning parameters (Optimize performance)
- Structured menus for new users
- Command oriented for experienced users
- MVS 3.8, SP and XA support
- Free trial period

Call or write for details
Applied Software, Inc. 840 U.S. Highway #1, Suite 250
P.O. Box 13027
North Palm Beach, FL 33408 (305) 626-4818

IN DEPTH

alleviated in 1978 with the release of a new set of Vtam/NCP packages extended with the Advanced Communications Function (ACF). These new releases provided improved stability and application interfaces, as well as better operator facilities. ACF/NCP offered the ability to alter device configurations dynamically on the network; it also provided improved testing and error diagnosing/reporting capabilities. ACF/Vtam supplied corresponding support for these features. Furthermore, ACF/Vtam and ACF/NCP supported and were com-

A major evolutionary event in the history of SNA occurred in 1981 with Release 3 of ACF, a new level of SNA software intended to support expanded network capabilities.

patible with several new program products that dramatically improved network flexibility and network management capabilities.

The ability to integrate multiple hosts in a single network was provid-

ed with a new feature of Vtam, the Multiple System Network Facility (MSNF). An example of a multihost system is shown in Figure 3. MSNF supplied the capability for any terminal in the network to be in session

with an application in any host. It also supported application-to-application sessions between two separate systems. A related product, Network Job Entry (NJE), provided further capabilities for processing in multihost systems. With it, batch jobs could be transferred from one host to another for execution, and job output could be transferred among hosts for printing or browsing.

A powerful tool to assist operators in network definition and monitoring became available with the Network Communications Control Facility (NCCF). Running as a Vtam application, it provided a program operator interface to Vtam, accepting commands from the NCCF operator and passing them along to Vtam. It permitted the creation of a network master terminal to which Vtam messages from all hosts could be channeled, while collecting those messages in a single log. NCCF also supplied a capability for defining and executing command lists similar to Clists in TSO.

NPDA Services

With large networks of complicated configurations now possible, a tool to assist in troubleshooting network problems was needed. This capability was made available with the Network Problem Determination Aid (NPDA). It is a Vtam application program that runs as a task of NCCF. NPDA performs a wide range of problem-determination services:

- Recording error statistics on network resources.
- Providing interactive and dynamic display of current networking conditions.
- Maintaining history data bases on network resources.
- Generating alarms as resources approach on overload state based on predefined threshold values.
- Permitting concurrent testing and production usage.
- Determining and reporting on probable cause of failures.

Performance monitoring in general also needed automation, and this ability was provided with the Network Performance Analyzer (NPA). Resources that it could monitor included utilization of lines and 3705 processors and buffers; message rates of lines and logical units; and error rates for lines, physical units and logical units. It further provided threshold reporting on error rates, data rates, queue lengths, 3705 utilization and polling rates.

All of this collected information was maintained in a data base for subsequent reporting and interactive retrieval. Performance analysis functions did not extend to the NCP; however, this feature would come in a later release.

ACF/Release 3

The next major evolutionary event in the history of SNA occurred in 1981 with Release 3 of ACF, a new level of SNA software to support expanded network capabilities. Extensions to Vtam included the ability to

SCHOLAR/TEACH 3[®] makes every terminal a virtual teacher.



We know.

At Boeing Computer Services, we know the importance of good teachers. But even good teachers can only be in one place at a time.

After years of experience with both classroom training and computerized learning, we have developed a unique software product that lets you deliver your best teaching. On request. Repeatedly. No student travel required. It's called SCHOLAR/TEACH 3, and it can train 3,500 students a week.

Our training background with many different kinds of employees helped us create flexible authoring and presentation software to support any number of subjects. From making reservations to handling insurance claims to creating COBOL programs.

Furthermore, SCHOLAR/TEACH 3 is designed to fit your equipment. You can author or present your training sessions on your IBM or compatible mainframe. Or IBM PCs. Or use our MAINSTREAM[®] teleprocessing network.

And, because SCHOLAR/TEACH 3 was designed by experts in both training and computing, we can meet

your special training needs.

We've trained more than 500,000 employees both within The Boeing Company and other major corporations throughout the world. Now we'd like to share what we know with you.

Send for your FREE copy of *Ten Things You Should Know About CBI*.

Just write Boeing Computer Services, Education & Training Division, P.O. Box 24346, M.S. 9A-90-8B, Seattle, WA 98124. Or call us today toll-free at 800-342-7700 (in Washington State call 206-575-7700). Discover the lesson we've learned: behind all good CBI is the spirit of a good instructor.

BOEING COMPUTER SERVICES

A Division of
The
Boeing Company

specify classes of service and network priorities for network traffic. This was particularly useful in networks incorporating satellite communications channels, with their high capacity but relatively long transmit/receive delays. It was also beneficial where network traffic consisted of both batch and interactive transmissions. NCP extensions further expanded network possibilities.

Transmission groups, which are multiple parallel links between 3705s, replaced single links, and multiple transmission groups were permitted between pairs of 3705s. Remote-to-remote links were allowed; previously only one level of remoteness had been possible. Multiple session routing was supported where a session would select one of several predefined routes based on priority and availability. All of these capabilities contributed to improving throughput and ensuring reliability. Figure 4 illustrates the possibilities of networks at this time; compare it with Figure 3 to get an appreciation for the added capabilities.

SNA – Version 2

IBM is known for its ability to do a great many things well, but consistent naming of its products is not necessarily one of them. Version 2 of SNA, released in 1982, does contain several significant enhancements, but it is hardly the revolutionary advance one might expect of it, given

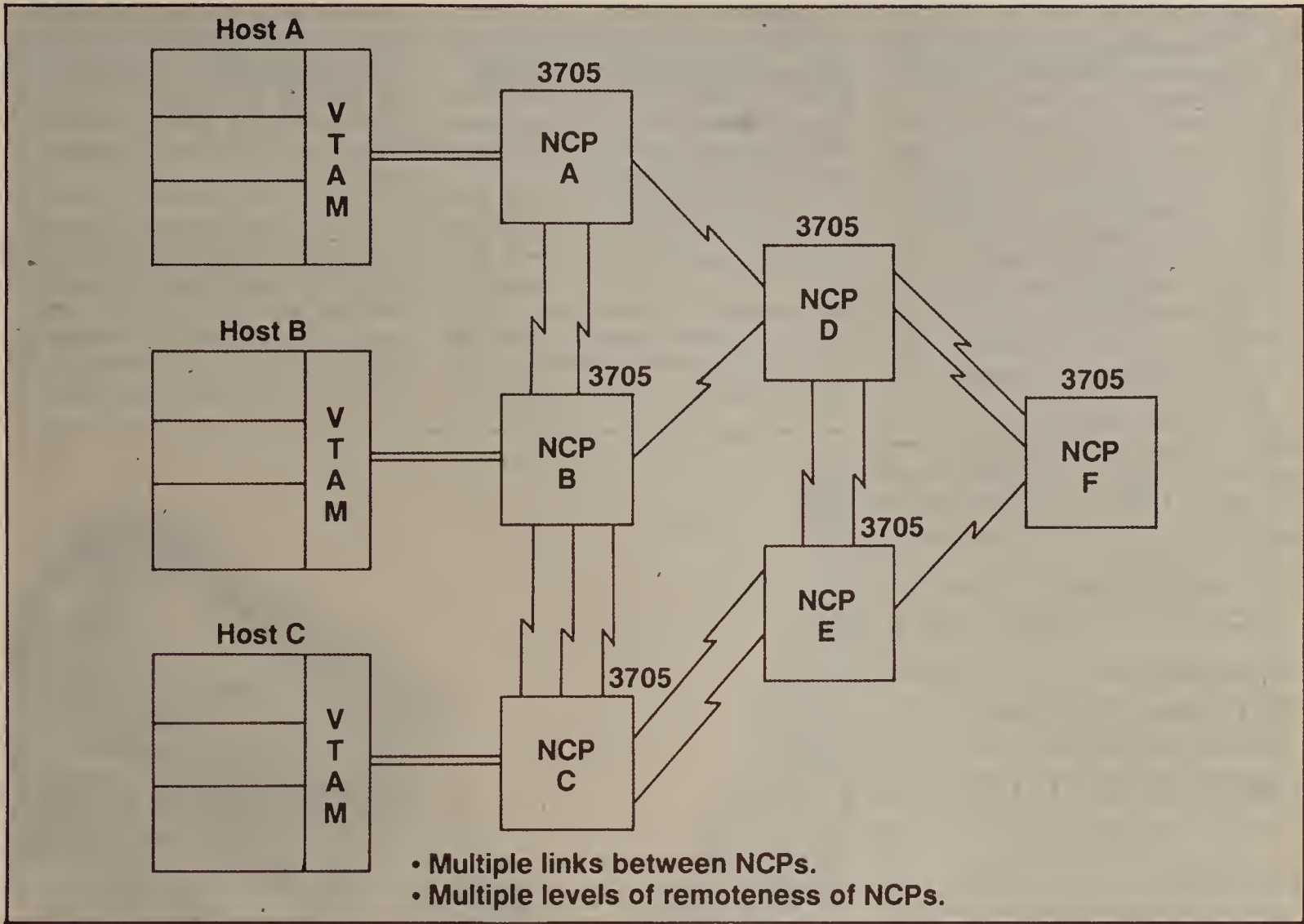


Figure 4. ACF/Release 3 Networks

its weighty designation. This latest release provides productivity aids for network systems programmers, and

Network Performance Analyzer functions are now integrated into the NCP. Multiple system coupling, for-

merly a separately available option, is now a standard feature.

The most dramatic enhancement is the ability to link mainframes with direct channel connections without a communications controller in between. That suggests a number of interesting possibilities such as channel-connected dedicated data base machines.

Communications Architecture

Preceding each of the hardware and software products described in the previous section was a substantial body of concepts and specifications directing the design of those products, and that is what SNA really is. It is a set of definitions of protocols and formats under which to implement compatible communications products. SNA is not something tangible like a piece of hardware or a listing of software. The NCP, for instance, is not a part of SNA; it is a software product implemented to standards defined within the architecture.

Furthermore, it is unlikely that any SNA communications component will ever contain all the functions allowed in the architecture. Instead, each product implements only that portion of the architecture it requires to perform its function.

Another important aspect of SNA's scope is that it does not govern the method of implementation of any function; that is, it does not require that a given function be implemented in hardware or software or some predefined combination of the two. It does dictate the structures that a function must use and the protocols it must observe.

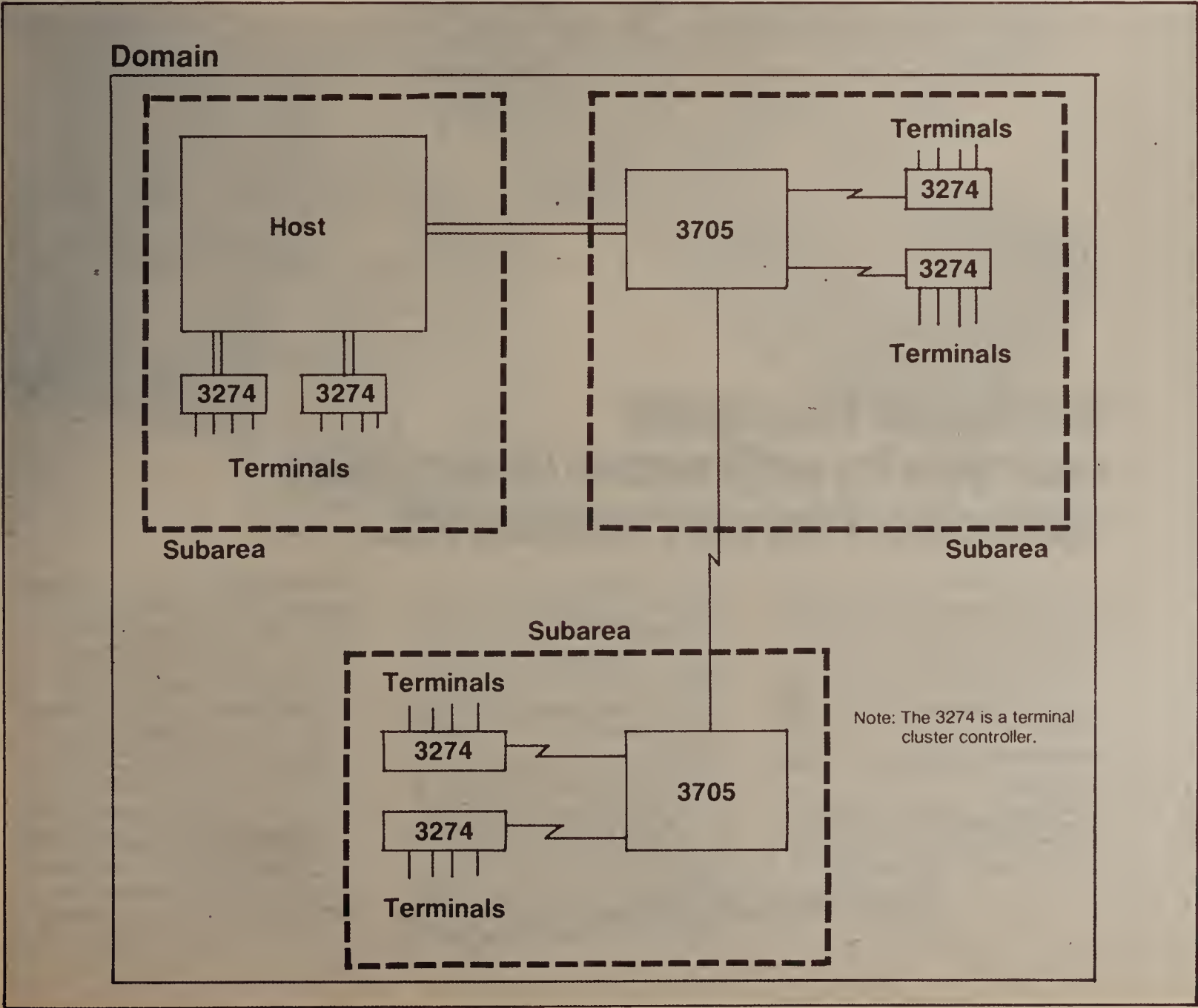


Figure 5. Domains and Subareas

IN DEPTH

Finally, it needs to be understood that SNA is not a monolithic entity of implemented components which provide services that must be used to accomplish data communications. For example, while CICS uses Vtam as a telecommunications access method, within CICS are some functions duplicating services provided by Vtam. This was done because it was easier to directly implement those functions within CICS, and this in no way violates rules of the architecture.

Elements of the Architecture

Any data communications network consists of communications lines and all the nodes at which one or more of those communications

A 48-bit address space permits a network of awesome proportions. No network with that many NAUs is likely to be created in the near future.

lines terminate. In SNA networks, those communications lines are of two basic types: local lines connecting a device directly to a host processor's channel and remote lines interconnecting devices with serial data links, which range from slow analog telephone circuits to high-capacity digital satellite links. The nodes that the lines interconnect include such familiar objects as host processors, communications controllers, terminals and RJE devices.

In every SNA network resides at least one central control and coordination facility. This is called the system services control point (SSCP); it resides in a host processor and may be thought of as the "brains" of Vtam. The SSCP is responsible for managing and allocating all network resources under its control. Those resources include not only the hardware components and communications lines, but also application programs known to the SSCP.

Any individual resource is known to the SSCP as having a unique network address, and thus this wide variety of network entities is referred to as network addressable units (NAUs). All NAUs under the control of an SSCP constitute a domain. For the moment, the discussion will be restricted to single-domain (single-host) networks, but the topic of multidomain networks will be explored later.

Within each domain are one or more subareas. A subarea is comprised of a host/SSCP and its locally attached NAUs or a 3705/NCP and its locally attached NAUs. A domain and its subareas are illustrated in Figure 5 (on In Depth/37).

There are basically two types of network addressing used in SNA: networkwide addresses and local addresses, known only within a subarea. Early SNA networks utilized a 16-

bit network address, but it was foreseen that this would eventually be too restrictive. In the current definition of SNA, network addresses have two components: a 32-bit subarea address and a 16-bit element address within the subarea.

Now, a 48-bit address space permits a network size of awesome proportions, and no network with that many NAUs is likely to be created in the foreseeable future. However, it should be remembered that at one time, a 24-bit memory address space in the early 360 processors was

thought to be more than sufficient. The new 3084 processors with their 31-bit addressability to real memory are presenting IBM with a major task in modifying its system software to accommodate the new memory capacity.

A shorter 8-bit address is used for localized data flow within a subarea. For example, a 3274 cluster controller can have a maximum of 32 terminals attached and clearly has no need to support full network addressing. The process of conversion between network and local addresses will be de-

scribed shortly.

In addition to the SSCP, there are two other major types of NAU: physical units (PUs) and logical units (LUs). A PU may be thought of as the manager of the physical resources of a node, and each node will usually contain exactly one PU. Most nodes will also contain one or more LUs; these are, effectively, interfaces between the end users and the network. An end user is an application program, a terminal operator or any other user of the network's communications services.



Some of the best names in software are quite attached to our network.

These people know PCs. They also know a good idea when they see one. That's why they're building future networking software around today's networking standard — Ethernet. And why they chose our PC networking system to help them do it. EtherSeries from 3Com.

What EtherSeries is doing for them.

"3 large, growing, and diverse Ethernets are at the heart of our software development activities. Our 3Com hardware has been very reli-

able — it has never failed us."

— Bill Gates, Chairman, Microsoft (Bellevue, Washington)

"We want to develop our popular dBase II® to a multiuser networked database environment. To meet the demands of our customers we chose the high-performance 3Com EtherSeries."

— David Clayton Cole, Chairman, Ashton-Tate (Culver City, California)

"The ease of sharing information and printers led our 1-2-3® advanced development team to choose 3Com's EtherSeries™ over all of the alternatives."

— Mitch Kapor, President, Lotus Development (Cambridge, Massachusetts)

"We wanted network software transparency. Our PFS:® software runs without ANY change on 3Com's EtherSeries™ — it protects our user's software investment."

— Fred Gibbons, President, Software Publishing (Mountain View, California)

"The Ethernet standard and 3Com's EtherSeries™ will be an important part of our in-house networking strategy. It provides the connectivity we require for our growing organization."

— Bob Frankston, President, Software Arts (Wellesley, Massachusetts)

"Our mainframe link software and Peachtree software ran perfectly in the 3Com environment. We dropped

IN DEPTH

It should not be inferred, as the names might suggest, that PUs are hardware implementations and LUs are software implementations. It is also untrue that LUs do not concern themselves with interacting with the physical processes of data transmission. PUs and LUs were defined as a mechanism for the distribution of functions and responsibilities within a node.

Four PU types currently exist in SNA:

PU Type 5 (PU.T5) is the physical unit of a host processor and is imple-

mented within Vtam.

PU.T4 is the physical unit residing in 3705 and is implemented within the NCP. Currently, communications controllers are the only nodes that have only a PU and no LU.

PU.T2 is a cluster controller like the 3274.

PU.T1 is defined for pre-SNA 3270 terminals and is provided so that a large base of existing equipment could be incorporated into new SNA networks. While they may play a dominant role in many existing networks, their future architectural

significance is limited and they will be disregarded here.

PUs of one type may communicate with PUs of any other type. Nodes containing a PU.T5 or PU.T4 are designated as major nodes, and PU.T2 nodes are designated as minor nodes. Thus, another way of defining a sub-area could be to say it is a major node with all locally connected minor nodes.

There are six currently defined types of LUs which effectively define the mode of communications between two nodes. In most LU-to-LU

communications, one of the LUs will have access to more powerful resources and will thus assume greater responsibilities in the management of the communications. The more powerful LU is designated the primary LU (PLU) and the other the secondary LU (SLU). Unlike PUs, LUs may only communicate with other LUs of the same type.

The types of LUs are:

LU Type 1 (LU.T1) is used for communications between an application program and a remote SNA printer or workstation using what is known as SNA character strings (SCS), which contain data and formatting commands. SCS have more flexible and appropriate commands for printer control than a 3270 data stream (LU.T3). Printers compatible with SCSs include 3287 and 3289 printers and 3777-type RJE workstations.

LU.T2 is used for communications between a 3270 display device and an application program. The data stream transmitted includes formatting commands embedded with the display data. The commands provide field attributes such as highlighting, color and modifiability and display formatting control information.

LU.T3 is similar to the LU.T2 except that the display device in this case is a 3270 printer running in 3270 data stream mode (as opposed to SCS mode). Originally, all 3270-type printers supported only 3270 data streams; SCS capabilities were added later to support LU.T1 communications. The data stream is very like that of a 3270 display station data stream, except that not all attributes are relevant or supported (for example, cursor positioning commands are irrelevant to a printer).

LU.T4 is used primarily to support much of IBM's office products equipment for both host-to-terminal and terminal-to-terminal communications. The terminal-to-terminal type of communications is somewhat unique among currently defined LU types in that both LUs have the same capabilities and share the same responsibilities. This is known as a peer relationship.

LU.T6 supports communications between two application programs, whether they both reside within a single host processor or in separate hosts. It supports communications between two CICS regions, two IMS regions or even between a CICS and an IMS region.

It also allows user-written programs to communicate with CICS or IMS using a clean and documented interface. LU.T6 is a more intelligent protocol than those mentioned so far in that it has more sophisticated error-detection and recovery procedures and has access to more powerful data flow commands. LU.T6 pairs additionally have the capability to support parallel sessions (that is, multiple sessions between two single LUs).

LU.T0 is at once very like LU.T6 and very different from it. Like LU.T6, it is a very intelligent proto-



EtherSeries™ right into our IBM Information Center and can now share disks and printers."

— Dennis Vohs, Executive Vice President, MSA (Atlanta, Georgia)

"We wanted the expandability of 3Com's Ethernet as a base for our networked products. VisiSeries™ for EtherSeries™ is the beginning of a family which will include VisiOn.™"

— Dan Fylstra, Chairman, VisiCorp (San Jose, California)

What EtherSeries will do for you.

Tying into 3Com EtherSeries was a smart business move for these PC software experts. And it can be for

you too. You'll maximize office efficiency, now. Cut operating costs, now. And you'll realize the full potential of your IBM PCs using software that is readily available off-the-shelf, now. All for the low price of \$950 per link.

And until January 31, 1984, we'll give you our award-winning EtherMail — a \$750 value — with the purchase of EtherSeries and three PC links.

EtherSeries is available at leading computer stores. Call or write Cory Randall at 3Com for more details.

3Com is EtherNet.

☐ Please have your 3Com representative call.
☐ Please send me more information.

Name _____
Title _____
Company _____
Division _____
Address _____
City/State/Zip _____
Phone _____

3Com Corporation, 1390 Shorebird Way, P.O. Box 7390
Mountain View, CA 94039. Phone (415) 961-9602.

CW11/14

IN DEPTH

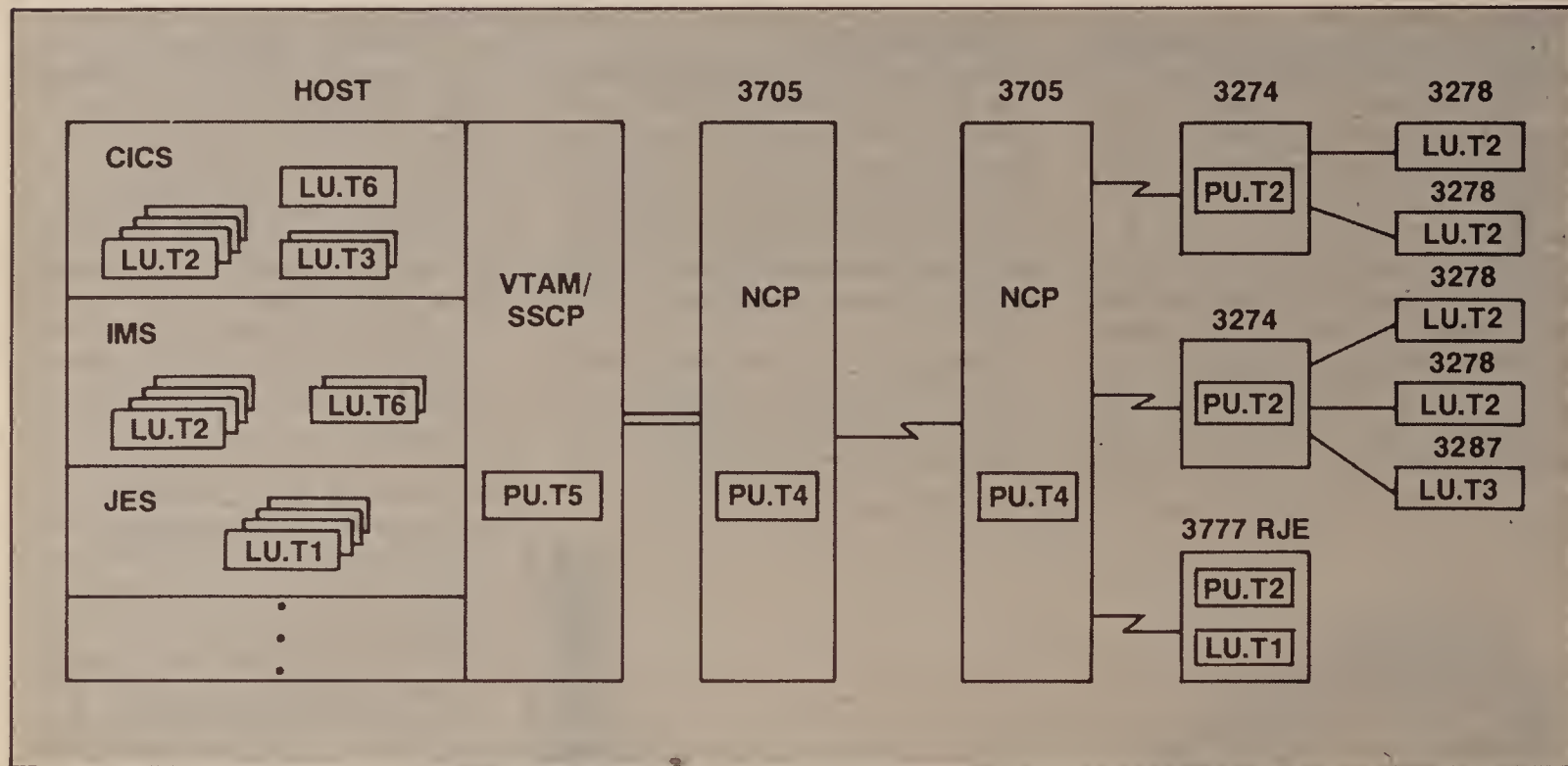


Figure 6. Physical Units and Logical Units

col and is suitable for application-to-application communications. But unlike LU.T6, which is very tightly designed, LU.T0 is open-ended. That is to say, it uses application-dependent message flows, and these may be tailored to meet the specific needs of the application. Also unlike LU.T6, it is not constrained to host-to-host

communications. LU.T0 provides "roll-your-own" capabilities. It offers great flexibility, but the price paid is the added responsibilities that the application must assume in defining and regulating its communications.

We are almost at a point where a significant group of concepts can be

tied into a comprehensible package. One more major SNA concept needs to be presented first: that of the session. First refer to Figure 6 in which various PUs and LUs are distributed in a single-domain network. Now, the whole purpose of the network is to enable communications between end users, and we know that the LUs

are the interfaces between the end users and the networks.

The session is the basic mechanism that ultimately allows those LUs to communicate in coordination with their attached PUs and the SSCP. A session is the establishment of communications between two nodes. In a single-domain network, there are three types of sessions:

SSCP-PU sessions are established by the SSCP. They define the ownership of a PU by the SSCP and allow the SSCP to confirm a PU's active status.

SSCP-LU sessions are also established by the SSCP. They permit the SSCP to determine if the LU is available and willing to engage in a session with another LU.

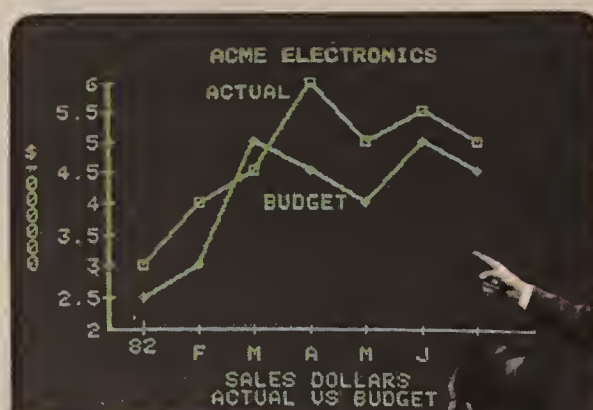
LU-LU sessions may be established by either LU in cooperation with the SSCP. They are required before application data may be exchanged between the end users. The initiation of an LU-LU session involves establishing an agreement for conversion rules between the LU partners.

Using the simple network shown in Figure 6, we can follow the process of a user at a terminal logging onto an application like CICS as a basis for illustrating the types and sequence of session establishment.

NOW ELECTROHOME HAS SIMPLIFIED

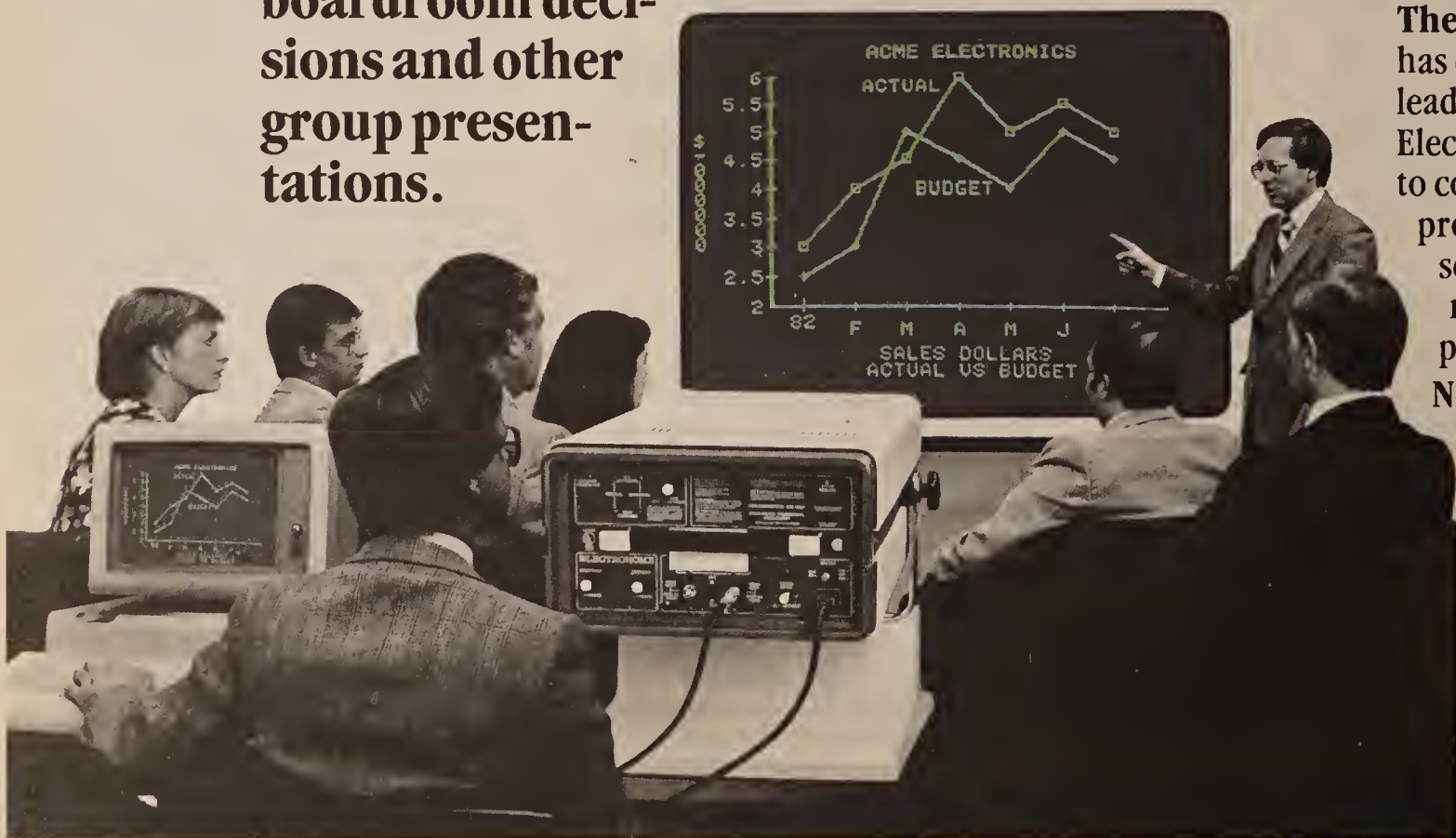
Electrohome EDP 57 has achieved worldwide success in monochrome computer projection for training sessions, sales meetings, boardroom decisions and other group presentations.

Now Electrohome ECP 1000 makes it just as easy to project color computer graphics and data or videotapes to big screen size.



The EDP 57 monochrome system has established Electrohome as a leader in computer projection. Now Electrohome is ready for your move to color computers — and your need to project color videotapes in training sessions, sales meetings, boardroom decisions and other group presentations.

New ECP 1000 is so sophisticated, it's simple. You can't imagine how easy it is to set up and operate. Colors are automatically converged in the unit and projected through a single lens — thanks to the Electrohome breakthrough in Laser Aligned Dichroics (LAD).



IN DEPTH

• First, the SSCP must establish a session with each physical unit (the host itself is a PU.T5 and the SSCP is effectively in session with itself when Vtam is brought up). The SSCP-PU sessions will be established either at the direction of control tables loaded into the SSCP during Vtam start-up or at the direction of the network operator at a later time. At this point, the only data that can flow is maintenance statistics.

• Next, SSCP-LU sessions are established with all LUs defined to the SSCP (or like SSCP-PU sessions, these may be explicitly initiated by a command from the network operator). It is at this time that the LOGON menus will appear on a terminal.

• The terminal may now be used to log on to an application in the host. The terminal operator enters the LOGON request, which is passed on to Vtam.

• Vtam then contacts the requested application, informing it of the terminal's desire to establish a session. If the application finds the terminal acceptable, it returns a request to BIND the LU-LU session.

• When the terminal sends back a positive response, the LU-LU session is activated, and the operator is now in a position to utilize the facilities of the application.

At the conversational level of a session between two end users, such as an operator in session with TSO, there is a dialogue that is much like two people conversing.

Thus, four sessions are involved in this process: an SSCP-PU, two SSCP-LUs and an LU-LU. The SSCP-PU and SSCP-LU sessions remain active after the LU-LU session is started and are available to initiate and service other LU-LU sessions.

Route Selection

In the preceding example of session establishment, there was no problem in deciding which data links to use in the exchange of information for any of the sessions, since there was only one route between the terminal and the host, and indeed this was always the case prior to Release 3 of Vtam.

But recall from the earlier discussion that with Release 3, several significant SNA enhancements made possible a selection of end-to-end transmission paths by providing multiple levels of remoteness for 3705s, transmission groups and par-

allel transmission groups between adjacent 3705s (as was illustrated in Figure 4). These new capabilities necessitated a mechanism by which the SSCP could select the most suitable route for establishing sessions, and thus were born explicit and virtual routes.

An explicit route (ER) defines an end-to-end path between two major subarea nodes (PU.T5 or PU.T4), one end of which must be a PU.T5. Major nodes between the end nodes must be PU.T4s. An ER definition specifies exactly one transmission group between each pair of major nodes along the route (a channel connection from a host processor to its local 3705 is considered a transmission group). ERs must be reversible (that is, the physical path information uses flowing in one direction must be the same physical path on which it flows in the opposite direction).

ERs define only a data path; they

cannot be assigned with attributes such as priority. However, ERs are used as the basis for the definition of virtual routes, which do have those attributes.

A virtual route (VR) is used to define the path between two LUs in the network. A VR must be mapped onto an ER from one end of PU.T5 to another major node along the route. But because a VR is between two LUs and an ER is only between major nodes, a route extension (REX) is used to complete the definition of a VR. Figure 7 (on In Depth/42) illustrates a network upon which is defined several ERs and VRs.

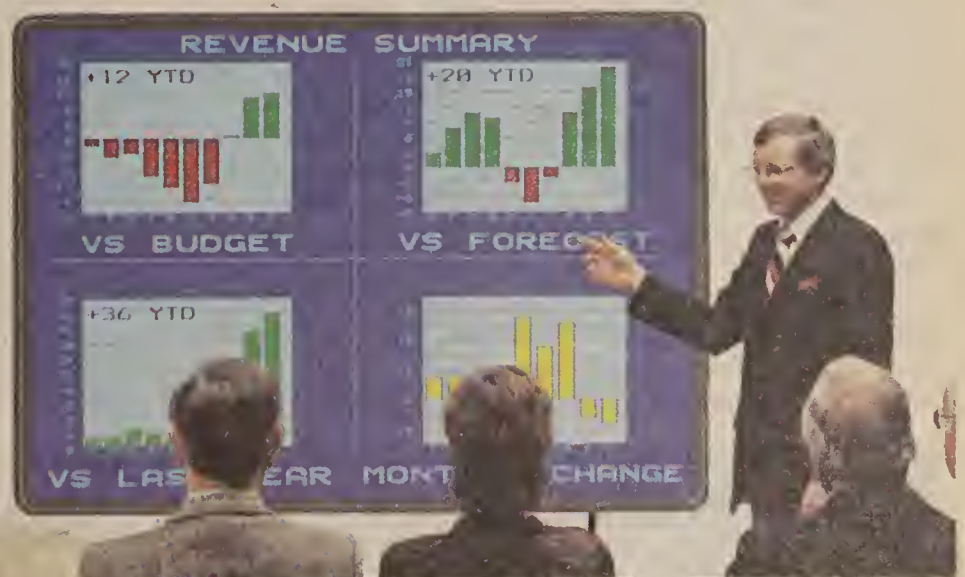
In choosing a VR for an LU-LU session, the SSCP will consult a table containing one or more virtual routes available for the session. It will assign a VR to a session based on a priority scheme assigned at network generation time. If this route is, for some reason, unavailable, it will attempt to assign the next highest priority route that is available.

Neither VRs nor ERs are physical circuits running from the originating node to the terminating node. Instead, information is packaged into transmittable units, sometimes called frames, which proceed one link at a time from node to node along the route. Upon receipt of a frame in an

COLOR COMPUTER PROJECTION.

By comparison, other systems have three lenses and dozens of controls that must be adjusted by trial and error to converge colors on the screen. You have easy one-button switching from high resolution data and graphics to brilliant video with

lock-in picture size. Ideal for portable or permanent use and for front or rear screen projection. And you can benefit from the last word in color video projection even before you move up to color computers.



ELECTROHOME

ELECTRONICS

A North American leader in projection technology.

Electrohome Limited, 809 Wellington St. N., Kitchener, Ontario, Canada N2G 4J6. Telephone (519) 744-7111. Telex 069-55449.

Please send me more information on the Electrohome

EDP 57 ☐

ECP 1000 ☐

Have a representative call ☐

I would like a demonstration ☐

Name _____

Company _____

Position _____

Street _____

City _____

Zip/Postal Code _____

EDC/C/11-14

Electrohome Limited
Advertising Department
Postal Station "D"
Box 10133
Buffalo, N.Y. 14210-0133

Phone _____

IN DEPTH

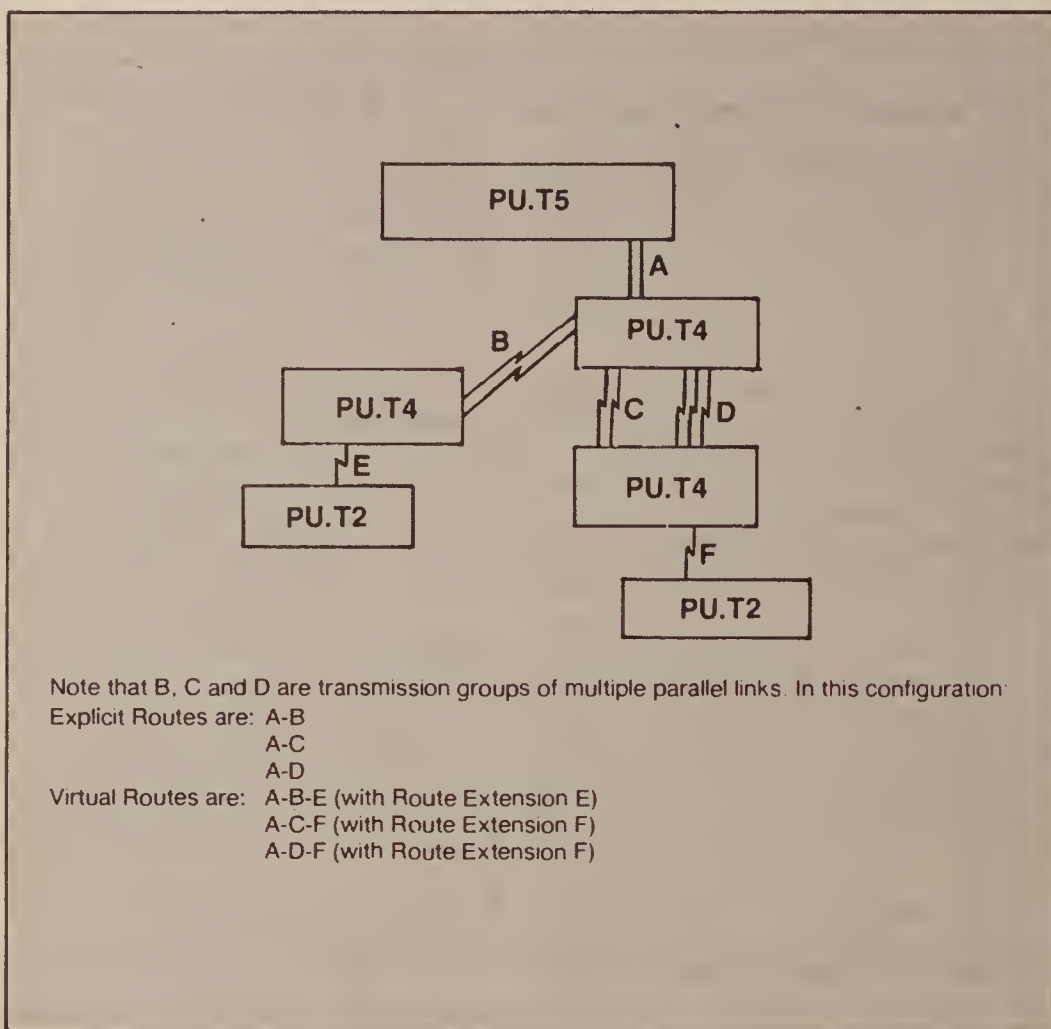


Figure 7. Explicit and Virtual Routes

intermediate node's buffer, that node must determine the next node to which it must be passed, and it may have to retain the frame a short time until facilities for this forwarding process are available.

Those familiar with the concept of packet switching will recognize this method to be in that category.

Transmissions, Acknowledgments

At the conversational level of a session between two end users, such as an operator in session with TSO, there is a dialogue that is much like two people conversing. The operator keys in a request for certain services, there follows a reply to the request which may in itself be another request, and the dialogue continues in this fashion.

At the network level, the terminology is different: Every transmission, whether that of a network command or user data, or a combination

of those, is called a request unit (RU). This choice of terms may seem unusual; after all, why call a command or even a block of data a request? The reason is that the extreme level of cooperation needed among network components and the intricate protocols defined to ensure that cooperation require that most transmissions be, effectively, requests.

Thus, a command of "Do ABC" is usually implicitly "Can you do ABC? Answer yes or no." Likewise, a transmission of end-user data is usually implicitly "Will you accept this data? Answer yes if so." In SNA, the answers to requests are called request responses (RR); they are acknowledgments to the originator of a request that the request has been accepted or that a problem has been detected. There are several possible protocols for responses to requests:

Definite Response: A response is required whether processing is suc-

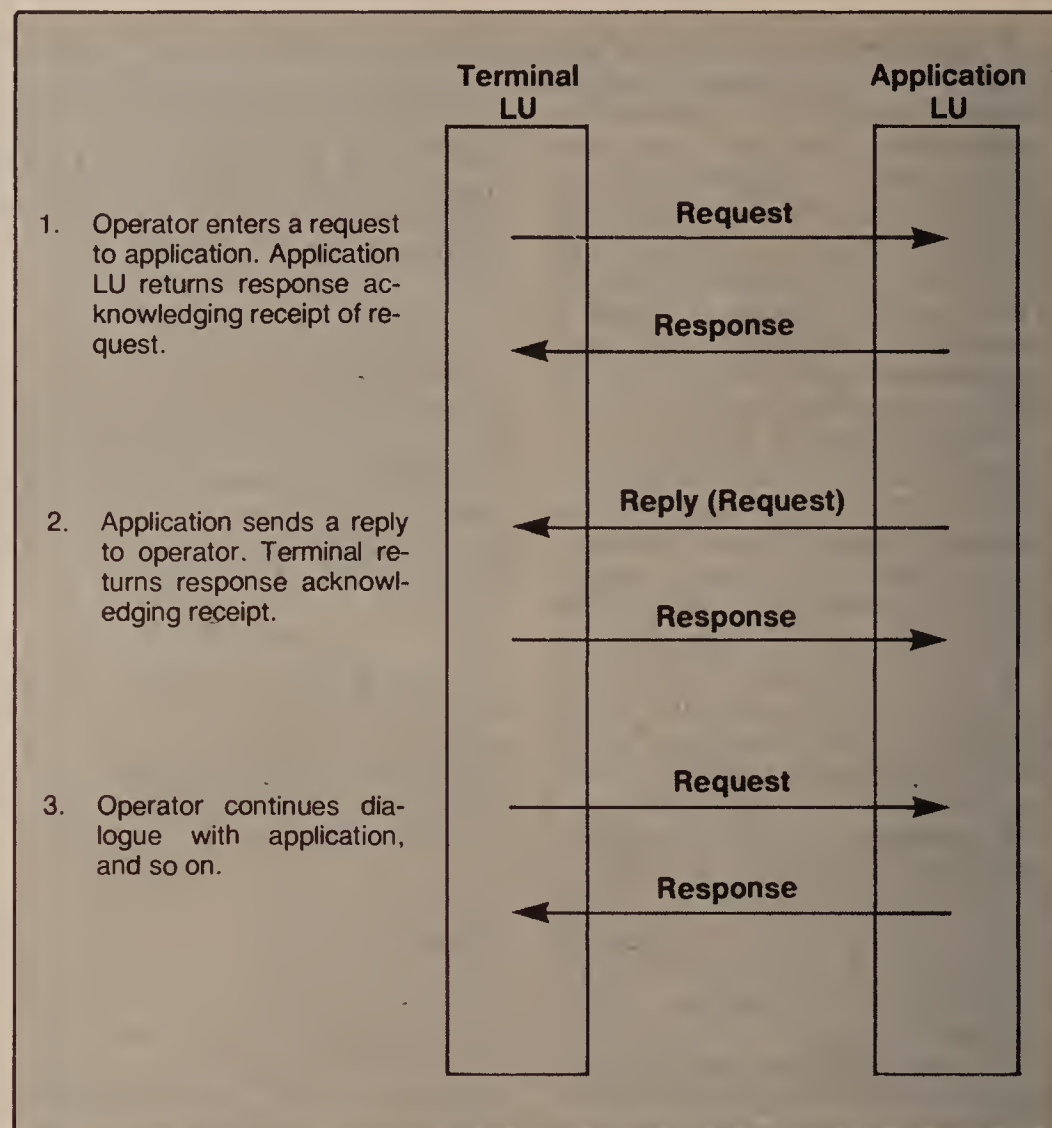
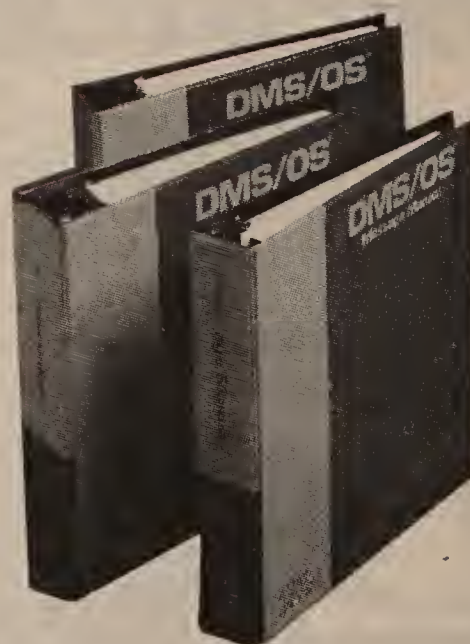


Figure 8. Requests, Responses and Replies



DASD MANAGEMENT AWARD WINNER

The world's leading DASD management system, installed in more than 750 Fortune 1000 sites. Tailored to IBM VS1 and MVS, operating environments, yet doesn't rely on any IBM utility. **DMS/OS** — with disaster recovery — gives you more space and more usable DASD reports. Here is a direct-access storage device management system that dramatically reduces DASD conversion time, frees up operator time, and provides enforced control standards.

Is it any wonder that over 75% of world's leading industries turn to Sterling Software Marketing and **DMS/OS** for DASD management?

For a free on-site evaluation without obligation, call TOLL FREE 800-824-8512. California, Alaska, Hawaii, and Canada call collect 916-441-7234. Ask for Ext. 41.

STERLING SOFTWARE MARKETING

Formerly Software Module Marketing

Crocker Bank Bldg. Penthouse
1007 Seventh Street
Sacramento, CA 95814

IBM is a registered trademark of International Business Machines, Inc.

AVOID DOWNTIME!

WATER ALERT®

FOR COMPUTER AREAS

Warns you of water leakage in sub-floor wiring areas.

- Produces a loud, intermittent alarm when activated by presence of water.
- Completely self-contained... no wiring, no connections.
- Early water detection (1/64" water film activates alarm) provides maximum time for corrective action.
- 24 hour per day monitoring.
- Options include remote indicator, remote flashing light, and automatic telephone dialer.

8 Models from \$59 - \$110

Call or write for complete information.

Dorlen Products

Division of Electro-Consultants, Inc.
7424 W. Layton Ave., Milwaukee, WI 53220
Phone 414-282-4840

SNA PRIMER

IN DEPTH

cessful or not. The response will contain that positive or negative status.

Exception Response: A response is required only when processing detects a problem; otherwise, no response is required. In this case, a lack of exception response is implicitly a positive response.

No Response: No response is required, even when processing a request is

The extreme level of cooperation needed among network components and the intricate protocols defined to ensure that cooperation require that most transmissions be, effectively, requests.

unsuccessful.

The response should not be confused with a "reply" at the conversational level of two end users. At that level, the dialogue is always exchanged in the form of RUs. The RRs are not visible to the terminal operator. Refer to Figure 8 for a simple diagram of this process.

Transmission Status

An RU flowing on the network may be sent as a normal transmission or designated as an expedited one. Normal flows account for the majority of RUs and usually include all end-user data. In normal transmission, RUs are queued and processed on a first-in, first-out basis.

However, if all RUs including network regulating commands were queued, situations could arise where a command issued to resolve a deadlock could not be passed through and acted upon because it would be awaiting

resolution of the deadlock itself. Therefore, the expedited transmission is used to send many high-priority network commands. An expedited RU will always move to the head of a queue of RUs awaiting transmission.

Next week, in the concluding

half of this primer, the authors will approach the "nuts-and-bolts" level of SNA more closely by examining the communications layers defined in the architecture, the physical contents of transmissions and some of the more important protocols supported.

A TESTIMONIAL FOR THE BURROUGHS B20 FROM SOMEONE WHO SPENT 17 YEARS AT IBM.



Dr. W. LEE SHEVEL
Senior Vice President, Corporate Operations, Burroughs Corporation

In operating systems, the B20 will soon give you a choice of CP/M® or MS-DOS.™ Or you can choose BTOS, our own operating system, which has more features.

To operate the B20, all you do is open the carton, plug it in,* choose one of our many business software programs (payroll, accounts receivable, inventory control, etc.), and you're in business. (Our step-by-step training manuals are so easy to use, you can be doing sales projections, accounting tasks, or scheduling in a matter of hours.)

If there are any questions, just call the Burroughs hot line. Trained Burroughs computer specialists will help with any problem that arises. (90% of all questions are answered in the first call.) We also have service depots in 19 cities throughout the U.S., or you can choose on-site servicing.

So, when it comes to choosing between IBM and Burroughs, take it from someone who knows both.

The questions isn't who's bigger. It's who's better.

Burroughs

THE QUESTION ISN'T WHO'S BIGGER.
IT'S WHO'S BETTER.

About the Authors

David Baer has been active in DP for 15 years, specializing the last few years in architectural design of large-scale, on-line applications. He is now technical director of IBM mainframe application development for Tera Corp., a Berkeley, Calif., firm that provides proprietary software and hardware to utilities and general industrial clients.

Jim Sturch is an independent consultant and instructor in various areas of data processing. He currently specializes in the areas of MVS and SNA and teaches an SNA course under the auspices of the Mariposa Corp. of Larkspur, Calif.



Saving you up to

50%

on your hardware needs

YOUR ALTERNATIVE SOURCE FOR PRIME COMPUTERS AND PERIPHERALS

1st solutions

...The Alternate Source

A Datamation Services Inc. Company
2001 East Campbell Avenue
Phoenix, Arizona 85076

(602) 957-0999
Ask for Don or Matt

*B22 mass storage unit requires installation by a qualified Burroughs service representative.
CP/M is a registered trademark of Digital Research, Inc.
MS-DOS is a trademark of Microsoft Corporation.
For more information call 1-800-621-2020 or mail coupon below:

I'm interested in the Burroughs B20 small business computer.
Please send me more information.

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Telephone _____

Send to: Burroughs Corporation
Dept. B20, Box 10934, Chicago, IL 60610

© 1983 Burroughs Corporation

CW-1114

Dataproducts makes all the printer you'll ever need. And we deliver it.

The Dataproducts B-Series band printers are the latest in their long line of quality line printers. The series is considered the work-horse of the industry, with print speeds up to 1,000 lines per minute. That's quite a plus.

Another plus is that you can get the entire Dataproducts

B-Series, as well as their BP Band Series, M Series matrix, and DP Series daisywheel printers, from Kierulff. Right now.

The Dataproducts B-Series sets the standard for print quality with the Mark V friction-free hammer-bank. Your operators will also appreciate the B-Series' built-in diagnostic display. And you can choose from three models for the print speed you need—300, 600, or 1,000 LPM.

If you need something even faster, there's the BP1500. With the same print quality at 1,500 LPM. And a cost-effective price.

All the other printers you'll ever need.

Consider the Dataproducts matrix printers, for example. Combining the low cost of quality matrix printing with the high performance of line printing. The M-200 prints at 340 cps. But if you don't need high speed, there is the M-120, which prints at a respectable 180 cps. Both bidirectional, logic-seeking printers are built with a 95% parts commonality for ease of maintenance and stocking of spares. And if you need bar codes or graphics capabilities? The M100 has them, plus all the features of the other two M-Series models.

Then there's the DP Series of

daisywheel printers. Combining proven design and modern technology. Providing high-quality, fully-formed character printing at true cost-effective prices. And, thanks to two different models (the DP55 at 55 cps and DP35 at 35 cps), you can select the right printer for your letter quality applications.

Our support won't end with the purchase agreement.

At Kierulff, we don't just sell Dataproducts printers. We offer a 90-day onsite warranty through TRW to ensure your printer performs as it should upon delivery. And afterward.

And we also can perform in-house configuration changes, giving you the proper interface with your host computer while guaranteeing quick delivery from our large inventory. Our staff is fully qualified in every aspect of computers, peripherals, and interfacing. So they can help you make the right decision, and provide the system you need. And want.

You see, we don't just think up solutions. We deliver them.



KIERULFF

System Products Group

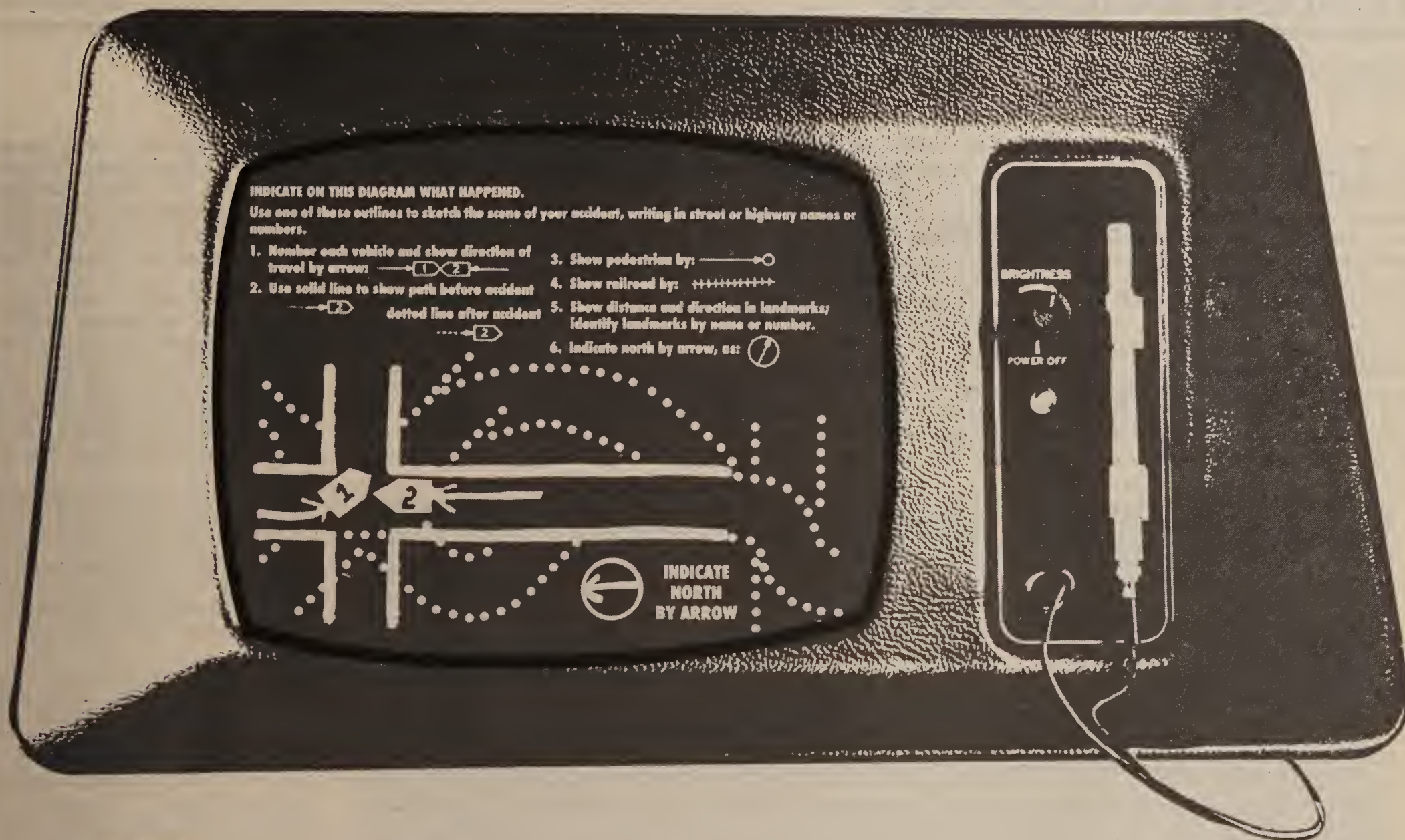
We help you put it all together.

Better.

AL Alabama (800) 237-8545 AR Arkansas (800) 331-3071
CA Los Angeles (213) 725-0325, (213) 994-0316, Palo
Diego (619) 278-2112, San Luis Obispo Zenith 19530,
Tustin (714) 731-5711 CO Englewood (303) 790-4444
DC Washington (301) 247-5020 DE Delaware (201) 575-6750
MI Miami and Palm Beach in State (800) 432-8028, St. Petersburg (813) 576-1966, (800) 282-8944
IL Elk Grove Village (312) 640-0200 IN Indiana (800) 323-0571 KS Kansas (800) 325-1039
ME Maine (800) 225-0692 MD Maryland (301) 247-5020 MI Michigan (800) 321-1436 MN Edina
(800) 237-8545 MT Montana (800) 525-1274 NB Nebraska (800) 525-1274 NC Greensboro (919) 852-9440 ND North Dakota (612) 941-7500 NH New Hampshire (800) 225-0692 NJ New Jersey (201) 575-6750 NM New
Mexico (800) 525-1274 NV Las Vegas (800) 528-4515, Reno (415) 968-6292 NY New York City (201) 575-6750, Upstate (617) 667-8331 OH Cleveland (216) 587-6558, In State (800) 362-1921, Out Of State (800) 321-1436
OK Tulsa (918) 252-7537, (800) 722-3900 OR Portland (503) 641-9150 PA Eastern (201) 575-6750, Western (800) 321-1436 RI Rhode Island (800) 225-0692 SC South Carolina (919) 852-9440 SD South Dakota (612) 941-7500
TN Eastern (919) 852-9440, Western (312) 640-0200, In State (800) 237-8545 TX Austin (512) 835-2090, Brownsville (512) 544-7212, Corpus Christi (512) 884-6167, Dallas (214) 343-2400, Houston (713) 530-7030, Laredo
(512) 726-1697, San Antonio (512) 349-0396, In State (800) 442-1041 UT Salt Lake City (801) 973-6913, In State (800) 662-8630, (800) 662-8631 VA Northern (703) 621-2592, Southern (800) 638-4994 VT Vermont
(800) 225-0692 WA Tukwila (206) 575-4420 WI Waukesha (414) 784-8160, (800) 242-6169 WV West Virginia (201) 575-6750 WY Wyoming (800) 525-1274 INTERNATIONAL: CA Compton (213) 774-7364, Telex:
69-1368, Outside Calif. (800) 421-2250

AZ Phoenix (602) 243-4101, Tucson (602) 624-9986
Alto (415) 968-6292, Sacramento (916) 924-8522, San
Santa Barbara Zenith 20014, Santa Maria Zenith 20014,
CT Wallingford (203) 265-1115, (800) 982-3901
FL Ft. Lauderdale (305) 486-4004, In State (800) 432-8028,
(800) 328-6357 ID Idaho (800) 453-8067, (800) 453-8068
KY Kentucky (312) 640-0200 LA Louisiana (800) 237-8545 MA Billerica (617) 667-8331
(612) 941-7500 MO Maryland Heights (314) 739-0855, (800) 325-1039 MS Mississippi
(800) 225-0692 NJ New Jersey (201) 575-6750 NM New
Mexico (800) 525-1274 NV Las Vegas (800) 528-4515, Reno (415) 968-6292 NY New York City (201) 575-6750, Upstate (617) 667-8331 OH Cleveland (216) 587-6558, In State (800) 362-1921, Out Of State (800) 321-1436
OK Tulsa (918) 252-7537, (800) 722-3900 OR Portland (503) 641-9150 PA Eastern (201) 575-6750, Western (800) 321-1436 RI Rhode Island (800) 225-0692 SC South Carolina (919) 852-9440 SD South Dakota (612) 941-7500
TN Eastern (919) 852-9440, Western (312) 640-0200, In State (800) 237-8545 TX Austin (512) 835-2090, Brownsville (512) 544-7212, Corpus Christi (512) 884-6167, Dallas (214) 343-2400, Houston (713) 530-7030, Laredo
(512) 726-1697, San Antonio (512) 349-0396, In State (800) 442-1041 UT Salt Lake City (801) 973-6913, In State (800) 662-8630, (800) 662-8631 VA Northern (703) 621-2592, Southern (800) 638-4994 VT Vermont
(800) 225-0692 WA Tukwila (206) 575-4420 WI Waukesha (414) 784-8160, (800) 242-6169 WV West Virginia (201) 575-6750 WY Wyoming (800) 525-1274 INTERNATIONAL: CA Compton (213) 774-7364, Telex:
KIERULFF, A DIVISION OF DUCOMMUN INCORPORATED

IN DEPTH



On-Line Insurance

By Kenneth E. Lantz

Computer systems have greatly changed the operation of today's organizations, but . . .

- Input is still often batch, or if there is on-line input, it is input to a file for overnight update in batch mode. The input comes primarily from company employees, with a few exceptions, such as via automatic teller machines (ATM).

- Output usually takes batch form — reports delivered to company employees. Some limited inquiry is being used, but it is usually preprogrammed. A management information systems (MIS) analyst has anticipated exactly what a user might want to know, and a programmer has set up specific inquiry transactions to help him.

- Data is usually kept in what are really files, although we started calling them data bases more than 10 years ago. True data bases are single files updated and used by more than one system.

The average insurance company's systems typify today's systems. Data is still passed from system to system. For instance, the insurance policy system may

pass information to the claims system with a substantial time lag. Often, the claims system has no direct way to access policy data. When a claim is entered, the adjuster quite often must input policy information manually at the same time.

The underwriting and policy issue processes are still a mixture of manual and computerized processes for most insurance companies.

When an agent or broker receives a request for coverage, he completes an application with information he receives from and about the prospective insured. The completed application goes to an underwriter, who uses rate tables, experience reports and actuarial studies to determine whether to propose coverage and what premium to charge. The underwriter prepares a quotation for the agent or broker to take back to the applicant.

The underwriter may have used the computer system to review rates. The experience reports he consulted may have been prepared on the computer. If he decides to cover the risk, the system may actually prepare the quotation. Then, if the applicant accepts, the

By 1990, insurance companies will keep information in true data bases, not copied from file to file. Underwriters and adjusters will have on-line access. Customers may even deal directly with the company's mainframe to apply for a policy or settle problems.

IN DEPTH

computer system may issue the binder and policy.

When there is a claim today, the insured may first call an adjuster to alert him to the possible loss. The adjuster gathers preliminary information from the insured and then calls the insurance company's claims department.

Claims department personnel establish a paper file and enter some data into a computer system. Part of that data may be information about coverage that is not available from the policy management system.

Claims department management assigns supervisors, attorneys and adjusters. Reserves are established, reinsurers notified, payments made, reports produced and someday, with luck, the claim will be closed.

In current insurance systems, employees usually work with batch input and output that is processed by computer systems whose primary function is to perform relatively simple, repetitive, voluminous tasks. The evolution of today's systems has been limited by how much hardware and software has developed and by

how much the systems designers have understood the organization's operations.

Future Systems

Computerized systems will have changed more by 1990 than we think possible. They will truly become what we now claim they are.

Input that doesn't come from other computerized systems generally will be entered through an on-line update process and may be entered by nonemployees. Responses to inquiries, which are a form of output,

will be made on-line if they are not voluminous. Some reports will still be generated, but many transactions may be produced on-line, possibly with later paper confirmation. Also, some output may go directly to non-employees.

Information will be kept in true data bases, not copied from file to file either by computer or, as in the earlier claims example, manually. We should no longer need to ask questions about the data, such as, "What date was it entered? Was it copied after yesterday's or today's file update?"

An important feature of the coming operational systems is that they will allow whoever needs to work with the data — an actuary, accountant or a product development manager — to examine, manipulate and analyze it while sitting at a workstation.

The production, communication, storage and use of information through computerized systems will occupy much of the business day for most people in such segments of American industry as insurance and banking. In 1990, a prospective insured may learn about a new type of policy through a videotex "commercial" from the insurance company. If he wants to apply, the videotex system will connect the insured's home terminal to one of the insurance company's mainframes.

The mainframe will collect and evaluate background information on the customer, determine whether to provide coverage, rate him and give a quotation — all while he waits.

If he accepts, the mainframe will debit his bank account for the initial premium and transmit a binder screen, which the potential insured may print on his printer. The mainframe will later print a policy in batch mode to be mailed to the insured.

In 1990, an insured may still call an independent claims adjuster to notify him about a loss. While the customer is on the phone, the adjuster may load a claims report screen on his workstation. (The insurance company's mainframe downloads the latest version of the screen whenever it changes.)

The adjuster will use the screen as a guide for taking information from the insured. The program downloaded with the screen won't verify coverage, but it will do such things as check the characteristics of the policy number and catch an alpha character entered as part of the Zip Code. After he has completed working on the screen, the adjuster may transmit the claims report to the mainframe.

The mainframe will probably verify the information in the claim report as soon as it is received. If a problem is found — such as an incorrect policy number — the mainframe itself may call the insured, use a voice synthesizer to ask for the correct policy number and recognize and record what the insured says in response.

What will companies use in the

What's Important to You?

Productivity? Reliability? Portability? Ease of Use?
They're a reality for business software development with

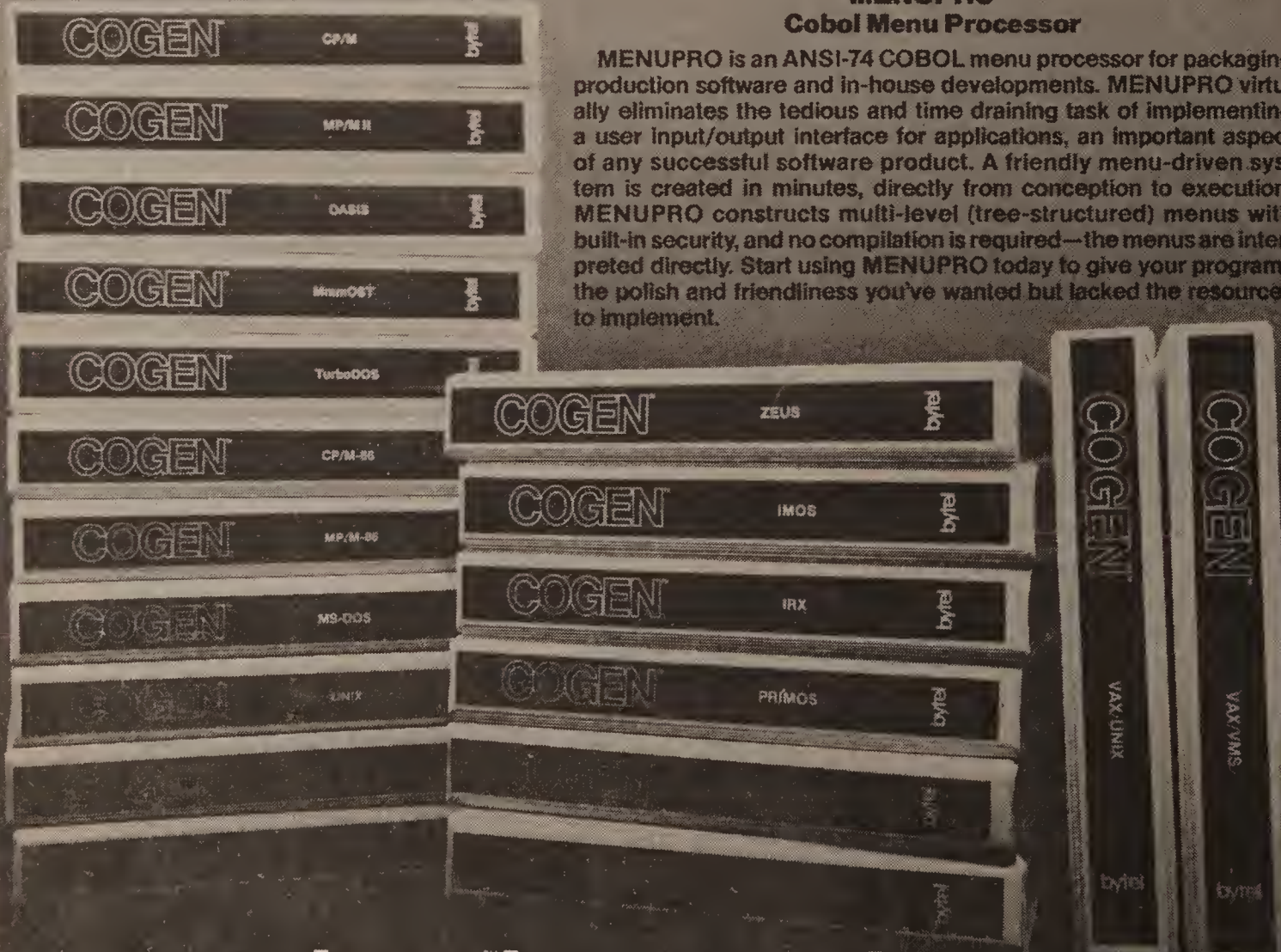
COGEN™ Cobol Program Generator

COGEN is a program generator for creative business applications with ANSI-74 COBOL. Simple interactions with menus and data entry screens produce modular, bug-free and self-documenting programs for business applications such as file maintenance, screen input and dis-

play, and report generation. COGEN is a powerful and proven productivity tool, used at hundreds of installations to reduce lead time on new applications, impose consistent coding standards for easy maintenance, improve training of new programmers, and ensure software portability. Now available also for Texas Instruments users under DX10 and DNOS. For Manufacturers, OEMs and Distributors, Bytel provides COGEN SELF-DEMO, a demonstration package for use by non-technical sales personnel.

MENUPRO™ Cobol Menu Processor

MENUPRO is an ANSI-74 COBOL menu processor for packaging production software and in-house developments. MENUPRO virtually eliminates the tedious and time draining task of implementing a user input/output interface for applications, an important aspect of any successful software product. A friendly menu-driven system is created in minutes, directly from conception to execution. MENUPRO constructs multi-level (tree-structured) menus with built-in security, and no compilation is required—the menus are interpreted directly. Start using MENUPRO today to give your programs the polish and friendliness you've wanted but lacked the resources to implement.



bytel corporation

1730 Solano Avenue • Berkeley, California 94707 • (415) 527-1157 • TLX 176609

See us at COMDEX Fall '83 booth #1093

IN DEPTH

future to develop operational systems? Three factors will be important:

- System development methodologies.
- User-friendly languages.
- Artificial intelligence (AI) systems.

System development methodologies, most likely involving prototyping, will be used for those systems that are jointly developed by users and MIS people. These jointly developed systems, though operational, will be focused primarily on establishing and maintaining data bases. That will be the principal reason for MIS participation, since data bases will be of major concern to MIS.

Users will be responsible for stating the operational requirements of the system. They will also contribute knowledge of their data and its uses to such a joint development effort. MIS people will contribute their knowledge of the company's data and the plans for its use.

In the world of the 1990s, users may be primarily responsible for developing non-data base systems. Consider the case of a user who wants to develop a new weekly report of all insurance claims requiring reserves in excess of \$5,000. With a user-friendly language, he would only need to mention the name of the data base that contains the information he wants — in this case, the data base with claims information. Using a workstation, he would describe what he wants the report to look like and where he wants each field to be placed. He might also need to list the information element names that he will be using.

If a standard layout is acceptable for the report, he will only need to list the element names. If he mentions a name that is not in the data dictionary, the dictionary system will question him and help him to select a name it recognizes.

The user will need to specify when the report should be produced, what kind of paper stock it should be printed on and to whom it should be delivered. He will also need to specify that a line should be produced on the report to indicate a claims reserve or reserve change exceeding \$5,000.

The line between user-friendly languages and AI systems may become greatly blurred by the end of the decade. How will AI systems work? Let's say a user wants to develop a new underwriting system, but he isn't sure how to begin. He might initiate a conversation with the AI processor and state just that.

The AI processor may begin by asking what data base should be used to determine coverage. The user would answer with the name of the data base that contains the experience, claims, reinsurance, rate and policy data. The processor would find this information in the data dictionary and set itself up to browse through the actual data base.

Next, it might ask what starts the underwriting process. Eventually, the processor would have a descrip-

By 1990, if a user wants to develop a new underwriting system, but isn't sure how to begin, he might start a conversation with an AI processor and state just that. When he has gone as far as he can in working with the processor, it may have built a system that can handle 70% of the underwriting process.

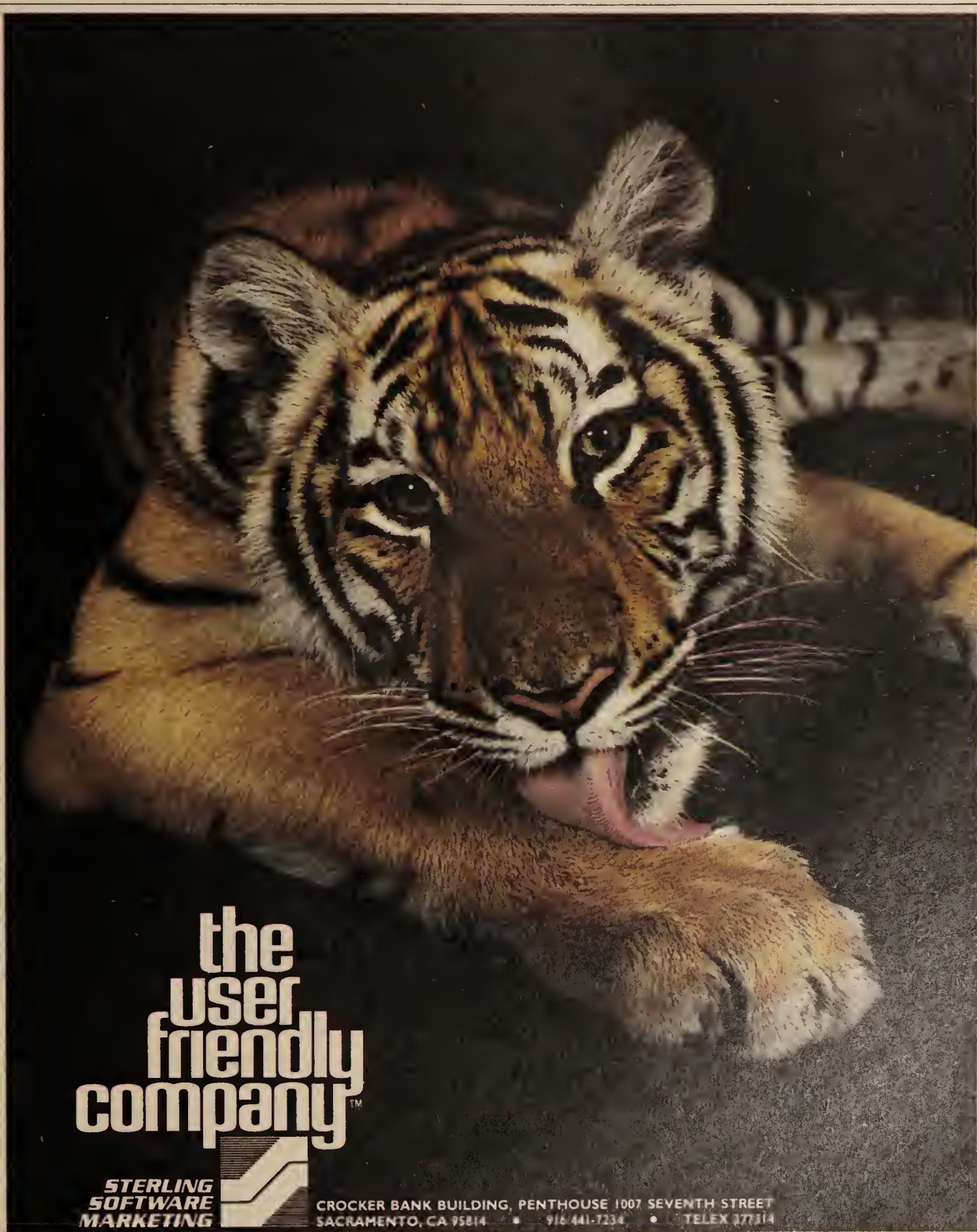
tion of all principal input and output of the underwriting process.

The AI processor may then engage

the user in a conversation about the underwriting process. What does an underwriter look at when he re-

ceives an application? What does he look at first? If the application is for property insurance, some of the first things looked at might be location, class, amount of coverage desired and deductible amount. One by one, the AI system would ask what part of the data base the user would look at for each of the underwriting elements, what kind of information he would be looking for and what kinds of decisions he would make based on what he found.

Maybe the user will not have any idea what is done with certain infor-



the user friendly company™

STERLING SOFTWARE MARKETING

CROCKER BANK BUILDING, PENTHOUSE 1007 SEVENTH STREET
SACRAMENTO, CA 95814 • 916/441-7234 • TELEX 377114

Over the past decade we have strived diligently to maintain your confidence in SMM as a reliable service-oriented software company. As our growth continues, we intend to ensure our capability to maintain your trust and your confidence in the products we present. So, we are proud to now be part of the Sterling Software group of companies. Our new association, and our new name —

STERLING SOFTWARE MARKETING — will continue to keep us on the leading edge in marketing high-performance software products. You can be assured that, although we may have a new name, our customer policy remains unchanged... "Where Service and Software Come Together."



IN DEPTH

mation. Then the AI processor may scan the data base with him, offering hypotheses for his consideration. It will try to produce a list of possible decisions.

When the user has gone as far as he can in working with the AI processor (which could take weeks), it may have built a system that can handle 70% of the underwriting process. The user may decide to have the underwriters, who will handle the remaining 30%, plug into the AI processor as they work.

The system developed by the processor will take care of what it can and then hand the application to the underwriter. As the underwriter does his part, the AI processor will ask him what he did and why he did it. As time passes, the system will be able to take over more and more of the process, although it may never handle 100%.

User Workstations

By 1990, the workstation should include a keyboard with at least as many keys as a terminal has now; a large, but quite thin, full-color TV-compatible screen; a handset (think telephone); a lightpen; and a communications line and memory, too, but they will be small.

Will a user have a personal computer at his desk by 1990? The workstation will provide access to personal computing, and it will evolve from the personal computer of today. At a workstation, the user will be able to produce, store, retrieve, manipulate and analyze information located in personal, corporate and external data bases.

When asking for data from a data base, the user need not give the names of the elements he wishes to use, only the name of the data base itself. The processor — a spreadsheet processor in this example — and the data dictionary will determine the specific information needed and provide it.

Let's assume that while the user is working, he receives a message across the bottom of the screen, accompanied by an audible tone, that he is to attend a video conference from his office. He might save what he is working on in order to call up review notes for the conference that he had made a few days before. As he looks them over on the screen, he will change phrases he doesn't like. To get a hard

copy of the notes, which may fill about two screens, he can request they be printed, perhaps in full color.

When the conference begins, the user may split his screen. Most of the attendees may be together in a conference room in London. They

will appear in the left two-thirds of the screen. Two people attending together from Boston will appear in the upper right one-sixth of the screen. The other attendee from Omaha will appear in the lower right one-sixth.

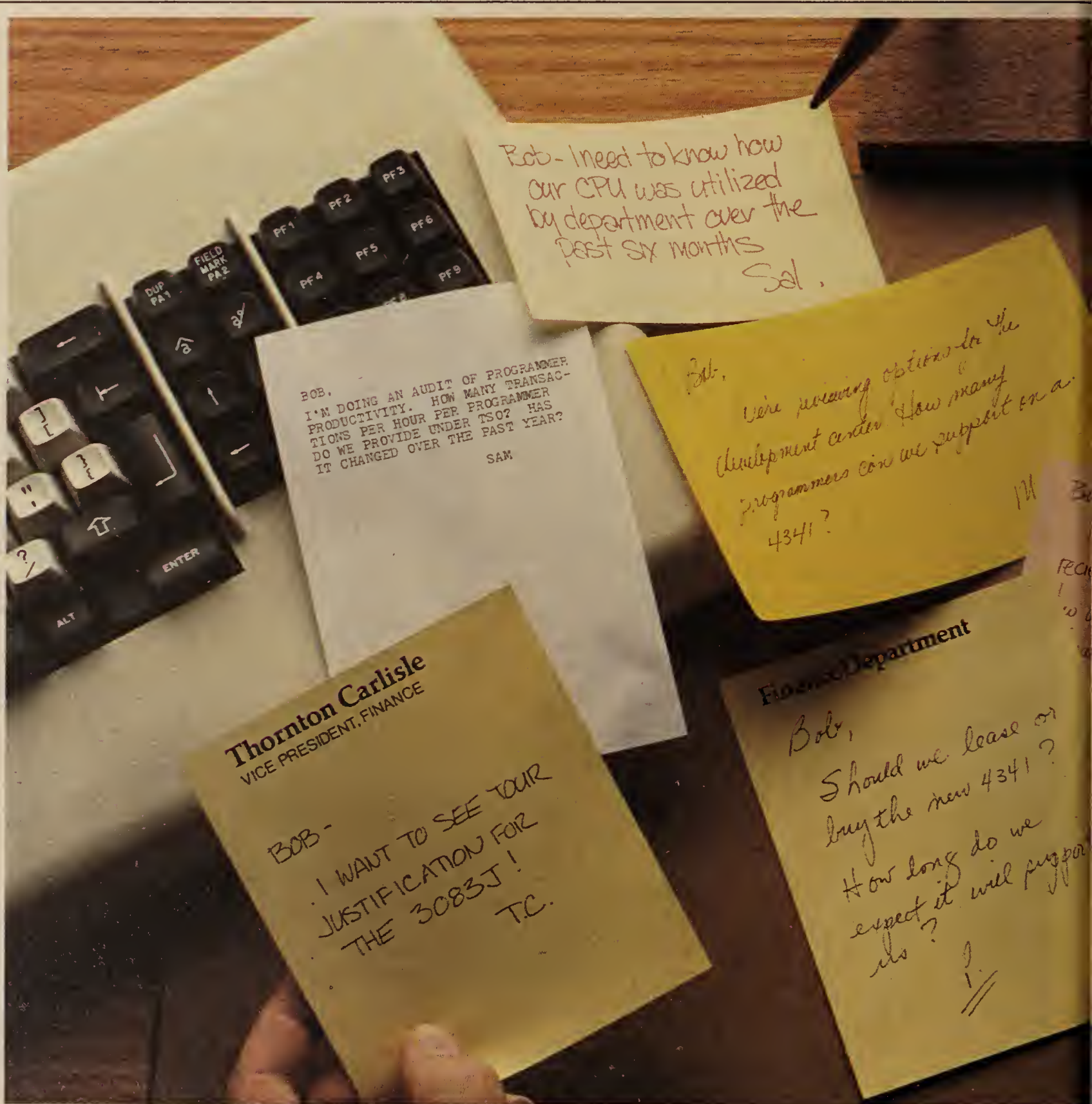
The full screen may be de-

voted to any one person at any time. Not only can the user see and hear *them*, but they can see and hear *him* because the workstation will also contain a concealed microphone and camera.

The user might also split his screen to call up any mail

he might have. He might make another temporary split in the screen to page through his calendar.

If a user takes a public speaking course, it will be transmitted to his workstation. If he wants some information from a videotex ser-



EVERYONE EXPECTS YOU TO HAVE THE ANSWERS. WITH BGS, YOU WILL.

Your company's multi-million dollar investment in data processing and data communications depends on how you answer questions. And you know that intuition, rules of thumb and seat-of-the-pants judgments are not the way. Intuition can no longer penetrate the increasing complexity of today's systems and networks. It can't provide the answers needed to guarantee agreed-upon service levels to your end-users. And it certainly can't produce cost-effective alternatives for future hardware needs.

BGS can. Only BGS has developed a completely integrated system to man-

age computer capacity. It enables you to analyze, forecast and model the performance of your host and data communications systems to get the answers needed for long-range planning and cost-effective control of your installation.

With the BGS family of software you can answer questions about how each workload uses the CPU and complex I/O configurations, allowing accurate system tuning. And for increased management control, BGS software provides trending, historical summary and exception reporting.

Further, BGS' systems include the most widely used modeling tool, BEST/1,™ to accurately forecast your system's performance. You'll know how your host and network will be affected by new applications, before installation. You'll be able to predict when response times will degrade. You can forecast precisely when and how you'll need to upgrade and expand, allowing you to evaluate hardware alternatives so that you can get the most out of your DP dollars.

And, to know how your host and network interact, BGS products serve as a complete, end-to-end host/network modeling

BGS...SYSTEMS FOR DP MANAGEMENT

IN DEPTH

vice, he will view it there. If he wants to use the service to transfer funds from his savings account, he can also do it at his workstation.

When a user is working with the AI processor to develop an underwriting system, he will do it at his work-

station. When he is composing a report, he will do it at his workstation. The user may also wish some deluxe features on the workstation, such as the capability to make audio or video recordings of his workstation's activity.

At this point, some analysis of the workaday world of 1990 computer systems should be attempted. What will all this hardware and software be working on, sending, changing, producing, creating, deleting? They will be operating on infor-

mation in two forms: messages and data bases.

Messages may be thought of as information in motion and data bases as information at rest.

The functions to be performed on the information are transmission, storage,

processing and reception.

Hardware will be used to perform the functions. We used to think of the basic hardware components as input, output, storage, processing and control. The components we will be focusing on in the 1990s will consist of terminals, storage, communications networks and processors.

The use of the word "terminal" doesn't feel right at first, but it's the best word for what needs to be described. Workstations will be terminals, and they will fit most people's idea of what a terminal is. The printer that receives a report will also be a terminal. So will be a cash register in a point-of-sale system, a video camera, an optical character reader and a voice synthesizer.

A terminal as described here is something that is hung on a network to send or receive messages — as well as 5,000-page reports. Storage will be a place where processors put information for later retrieval and reintroduction to a processor. The latter point is important to the concept: If a processor puts information on microfiche, from which it can later be retrieved by a processor and sent back over a network as a message, then the microfiche is storage.

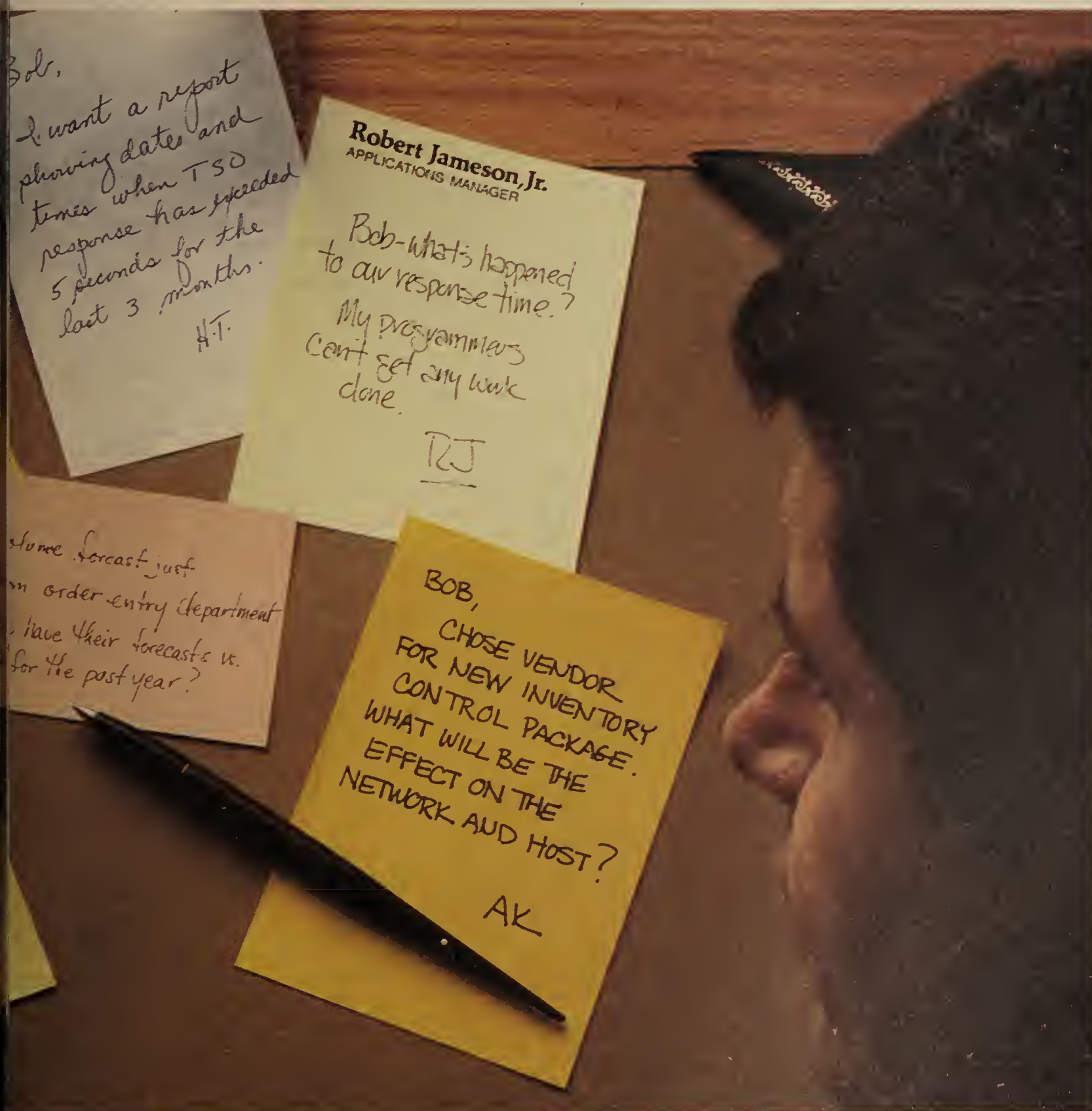
If, once the data is on microfiche, people can look at it with viewers and make copies — but a processor can't use it — then whatever put the data on microfiche will be a terminal, not a storage device.

Processors will be computers.

Communications networks will consist of lines, whether voice-grade, private, optical fiber, cable, satellite transmission — whatever the future holds — and the processors that control them.

In a sense, hardware will all be part of a network that the user will join when he sits at a workstation. Such an environment recalls Teilhard de Chardin's "Noosphere" — everything in the network will have an address. Minds and data bases will be connected through networks in which processors will expand the capabilities of the human. Yet the whole may become much more than the sum of its parts.

Hardware performs functions on messages and data bases, but not on its own initiative. Software uses hardware to operate on messages and data bases.



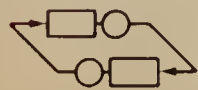
system. From initial design to scheduling timely network growth, BGS SNA network products give answers that keep you continually responsive to service and cost agreements with end-users.

And there's no question about BGS' claim. Over 500 large IBM installations answer their questions with BGS' computer capacity management systems. BGS has an integrated family of products for VM, MVS and SNA—specialized systems for managing your complex DP environment. With a BGS system, you have the methodology to control your

installation and plan for its future—keys to successful management.

Your questions need answers. Why risk performance: the host's, the system's, the network's, the end-user's, the company's and yours?

Call BGS, today. BGS Systems, Inc., One University Office Park, Waltham, MA 02254. (617) 891-0000. Telex 923314.



BGS SYSTEMS, INC.

IN DEPTH

The major software components will be:

- Information managers.
- Network managers.
- Processor managers.
- Development processors producing operational systems.
- Information processors enabling "symbiotic systems."

Information managers will include data base management systems (DBMS) and data dictionaries.

Network manager software, residing in processors, will control all facets of communications within a net-

work, as well as to and from external networks. It will include transmission, message switching, error detection and correction, encryption and decryption, access authorization and maintenance of usage statistics.

Processor managers will be operating systems.

Development processors will include user-friendly language processors, AI processors, report writers and whatever form language processors, such as Cobol, will take.

They will produce the operational systems that will maintain data bases

and perform the information-based processes essential to organizations.

Information processors will include inquiry and report language processors; analysis systems, such as spreadsheet processors; simulation language processors and text editors. They will be used for symbiotic systems.

Symbiotic systems are systems in which the person who initiates the conversation also controls its form and direction, while using one or more person-extending systems.

In contrast, operational systems

are ones in which, even though a person may initiate the conversation, the system itself controls the conversation's form and direction. An insurance claims system would be an example of the latter.

Whatever became of stand-alone word processors, office automation, information centers and personal computers in a business environment?

They served their purpose as intermediate steps along the way.

Word processors taught users the indispensability of computerized text editing.

Office automation showed users some of the things that could be done with internal information networks.

Information centers taught users how to draw directly on computerized data and showed MIS people that their primary concern must be information, not programs.

Personal computers were the first workstation, but more important, they were the catalyst that sped up everything that happened in the '80s.

Survival Guidelines

Nothing an organization does will be irrevocably bad, but some methods will certainly turn out better than others. DBMS will change; terminals will change; operational systems will change; communications lines will change. As time passes, these changes will become easier to make because more and more software and hardware aids will be available for changing and converting.

Nonetheless, as Rule 1 for the '80s, I would propose the following: The more distinctly a thing is what it is, the less it will hamper development.

The more a DBMS is a distinct DBMS, rather than being embedded within something else, such as an application package, the easier it may be replaced with another DBMS. If it is contained within an application package, the application package may have to be modified or replaced before an improved DBMS may be used.

The more a data dictionary is a separate entity, rather than being part of a DBMS, the easier it may be replaced with an improved data dictionary.

The less an inquiry language is part of a DBMS or a data dictionary system, the more easily it may work with most DBMS and data dictionaries and the less it will be affected by a change in either.

So beware of black-box solutions to systems problems. The more facets of software or hardware that a vendor's product bundles together, away from the user's control, the more it locks in the user and the less freedom his systems will have to evolve and progress without it.

Portrait of Application Software

Application software packages available in 1990 will probably be of two main types. The first will be generators that will allow the user to use

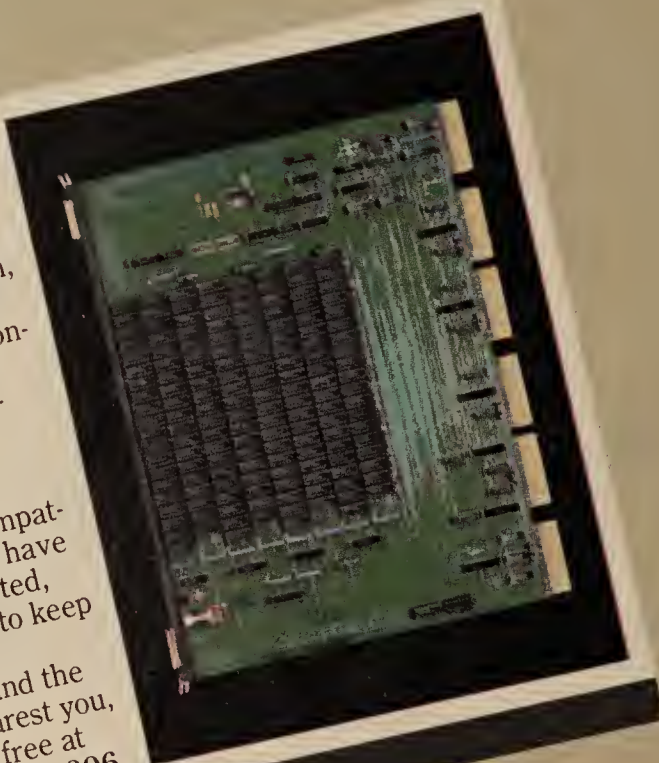
MEGABYTES FOR MINIBUCKS

Now you can save on one-megabyte VAX-11/780 compatible memory boards from National. With availability now, you can cash in on our NS789 board at an unbeatable price. Identical to DEC's board in function and form, the NS789 has one-megabyte of 64K based RAM, a two-year warranty and spare RAM on-board. And National offers an emergency loaner program if you ever need a replacement board.

Maximize your VAX potential.

Expand your memory capacity with compatible memory boards from National. We have the price and availability to get you started, with the service and long-term support to keep you going.

For complete NS789 specifications and the name of the representative/broker nearest you, call our Customer Support group toll free at 800-538-8510; in California, 800-345-4006.



National Semiconductor
MICROCOMPUTER SYSTEMS DIVISION

ALWAYS THE FIRST ALTERNATIVE FOR DEC-COMPATIBLE MEMORIES.

*VAX and DEC are trademarks of Digital Equipment Corporation.

LEADER OF THE PACK



The Quality Leader:

BASF disk packs and cartridges reflect BASF technology and quality, because unlike many suppliers, we make them ourselves.

BASF drive tests each pack at the factory to ensure optimum performance.

BASF commitment to magnetic media is now in its 50th year.



The Performance Leader:

BASF mirror-polishes its uncoated disks for optimum headflight characteristics.

BASF magnetically orients all oxide particles in the disk coating for greater packing density.

BASF coats, polishes, and burnishes each disk by its own process, for long-lasting, trouble-free operation.



The Value Leader:

BASF has the configuration you need "...for Burroughs, CDC, Data General, DEC, Honeywell, IBM, NCR, Wang...ready for immediate delivery at new low prices.



The Premium Leader:

BASF has a new premium program with exciting gifts to add extra value to your order.

For ordering or compatibility details, send the coupon today, or call toll-free 800-343-4600.



BASF Systems Corporation
Attn.: Marketing Services, Computer Division
Crosby Drive, Bedford, MA 01730

Please send me information on BASF Disk Packs, your new low prices, and premium program.

Name/Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone _____

CW



BASF

*For Burroughs: Front-load single disk cartridges, 80 MB Tridents.

For CDC: 80 and 300 MB storage modules, Phoenix single disk cartridges.

For Data General: 50, 100, 200, and 300 MB disk packs, top-load single disk cartridges.

For DEC: 100 and 200 MB 12-high packs, front-load single disk cartridges, 80 and 300 MB storage modules.

For Honeywell: Phoenix single disk cartridges, 80 and 300 MB storage modules, 100 MB packs.

For IBM: 100 and 200 MB 12-high packs, top and front-load single disk cartridges.

For Wang: Phoenix single disk cartridges, 80 and 300 MB storage modules, top-load single disk cartridges.

IN DEPTH

his own data dictionary and DBMS. They will contain the main thrust of the operational processing that the organization needs, but they may be tailored to fit the user's needs and tastes.

The second type of package will bundle the operational processing with the DBMS, possibly the data dictionary function and even the report-writing function. If an organization needs such packages, it will probably also need people from the outside to design and maintain its hardware configuration and commu-

nications network.

Nothing is more central to an organization's uniqueness than how it uses information. Consequently, how the user would define and structure information in a data dictionary is also unique. The user should not abdicate definition of his data to the vendors of application packages.

Somehow MIS must look beyond the distractions of an ever-increasing backlog of requests, frustrated end users and an explosion of hardware and software products to begin man-

aging information. MIS must accept responsibility for the organization's information.

MIS people must become experts in the organization's data. If a formalized data dictionary effort has not been started, MIS managers should push to have one started. They should encourage the creation of true data bases whose contents are defined in a data dictionary.

Ideas need time to gain acceptance. Many installations are just now recognizing the value of following a standard life-cycle approach for

systems development. But the development and freezing of detailed requirements as the basis for systems design will not produce systems that please users.

What is needed for the '80s is a methodology for change. Prototyping is such a methodology. End users need to be more closely involved with the design and modification of systems. Prototyping keeps them involved on a day-to-day basis.

Users need experience in user-friendly languages to help them learn how to produce their own operational systems. If you have already set up an information center, make sure you have staffed it well and are properly selling its use.

While an information center is important to users for learning user-friendly languages, it is even more important to MIS. The job of supporting an information center begins to tilt MIS toward providing information and away from processing it. It's a healthy tilt.

Nothing short of a cataclysm will stop end users from acquiring personal computers in vast numbers. And, despite what many senior managers in MIS think, the users will not produce mammoth problems with personal computers, nor get frustrated with them, nor tire of them enough to stem their spread. Granted that the software available for personal computers last year was not easy to use; it is quite a bit better this year.

MIS managers would be wise to proceed as follows: First, develop a plan for integrating personal computers into the network, including providing for downloading and uploading information. Second, determine the characteristics of personal computers that will fit the plan. Third, secure the services of people to help the users pick names, find software for them, install them, hang them on the network and use them. Then send those people out to join the users, not to fight them.

Last to be mentioned, but almost first in importance, is the communications network. Strive to have the organization combine the responsibility for voice and data communications and, more important, for message communications and information storage. Expand the organization's expertise in the design and management of communications systems.

About the Author

Kenneth Lantz is a principal with Atwater, Lantz, Hunter and Co., management consultants in Woodland Hills, Calif. He has worked for 27 years with more than 200 organizations as an information systems consultant, data center director, president of a software house, analyst and programmer.

Lantz headed IBM's application development project for computer-aided manufacturing and has developed decision table languages, data dictionary systems and systems methodologies.

He is currently writing a book on prototyping.

Meet The Only Laser Printer Ever To Run The New York City Marathon. From Quality Micro Systems.



Running the New York City Marathon means keeping tabs — or more precisely bibs — on more than 17,000 runners. Bibs that contain all the vital information to keep the marathon running in good order — in a single machine-readable barcode.

As each runner crosses the finish line, the coded information is read into the Marathon's database. Throughout the race, runners are easy to identify — by the three inch high numbers also printed on their bibs.

All printed by the Lasergrafix 1200 electronic page printer from QMS.

The Lasergrafix 1200 is our third winning entry in the New York City Marathon. For the past two years, the Magnum 3000

printer controller has provided the intelligent graphics necessary to direct the printing of bibs that keep tabs. This year, a more powerful intelligent controller will be driving the Lasergrafix 1200.

And what QMS intelligent graphics does for the New York City Marathon, it can do for all your business needs. Because QMS has designed a full line of print controllers and printer interfaces with applications firmware to handle whatever you can imagine. From letter quality word processing, to bit mapped graphics — to running a marathon.

Ask to see the Lasergrafix 1200 run in person. It covers a lot of ground.

And it does it standing still.

QMS
QUALITY MICRO SYSTEMS, INC.

P.O. Box 81250
Mobile, AL 36689/(205) 633-4300

WHERE IMAGINATION LEADS

To Access Bank Accounts

Mobil Unveils On-Line Payment Project

By Peter Bartolik

CW Staff

WASHINGTON, D.C. — The first on-line transaction system that would allow consumers around the nation to use bank debit cards for retail purchases was announced here recently by Mobil Oil Corp.

The system, which will be initiated in this area, will enable Mobil to receive immediate payments electronically from consumer bank accounts for purchases around the country at 2,400 gas stations that account for more than 50% of its gasoline pumping operations.

It is likely Mobil will activate the first nationwide retail-level electronic payments system, known under a variety of names such as direct debit point-of-sale, retail-level electronic funds transfer and

'We had two objectives, operational feasibility and customer acceptance. We were less concerned with the technical aspect, [and] we're very pleased in both areas.' — Thomas Lewis, vice-president at Virginia National Bank and manager for Mobil Oil Co.'s debit card test project.

others. Several major gasoline companies have announced experimental systems in particular areas of the country, and various bank-sponsored regional systems have also been announced; Mobil, however, is the first organization to announce definite

plans for a nationwide system.

Within two or three months, holders of bank debit cards in the Washington, D.C., and northern Virginia areas will be able to present their cards as payment for gasoline at 70 Mobil stations in the area, the company announced. Two shared automated teller machine (ATM) networks, Most and Cash Flow, representing more than 50 area banks, have signed agreements with Mobil to transfer funds from customers' accounts.

Most is the shared network operated by the EFT Group, Inc., a system serving 52 banks in the Washington-Maryland-Virginia area, including American Security Bank and Bank of Virginia. Cash Flow is a network comprised of Virginia National Bank, Riggs National Bank, Mercantile Safe Deposit and Trust Co. and Citizens Trust Bank.

According to Walter D. Manz, Mobil's general manager of marketing systems and control, the stations will be equipped with terminals that will transfer debit card identification to Mobil's credit center in Kansas City, Mo. From there, the information will be switched back to the ATM network for an automatic transfer from the customer's checking or savings account
(Continued on Page 104)

Micro-Based Operating System Out

SAN DIEGO — Softech Microsystems, Inc., a firm that got its start marketing UCSD Pascal, has brought out an operating system for microcomputer networks.

The operating system — called Liaison — provides a way of linking together micros that were previously unable to communicate with each other, according to John J. Splavec, president of the wholly owned subsidiary of Softech, Inc. In a demonstration held recently, equipment from IBM; Apple Computer, Inc.; Texas In-

struments, Inc.; and Corvus Systems, Inc. was shown operating on the same network.

Liaison is actually a superset of the company's "P-system," its UCSD Pascal operating code. The software is intended for multitasking and multiple users and can support a number of users constrained only by the hardware wired to the network, a company spokesman said.

The operating system also includes a
(Continued on Page 108)

Lee Data Adds Dual Controller To 300 Series of Control Units

MINNEAPOLIS — Lee Data Corp. recently announced the addition of a dual host controller to its 300 series of standard IBM 3274-compatible control units.

The Model 311 dual host controller reportedly offers dual remote host access capability and contains two remote communication interfaces that operate concurrently to enable display stations to switch freely between two selected IBM or compatible mainframes through keyboard commands.

The 311 operates in any Binary Syn-

chronous Communications or Systems Network Architecture/Synchronous Data Link Control combination and supports up to 32 display stations and printers. It can be configured to provide application redundancy or host backup for uninterrupted processing in the case of host failure or communication interruptions.

The unit is available for a purchase price of \$14,215, or a lease price of \$591 per month on a three-year lease from Lee Data, 7075 Flying Cloud Drive, Minneapolis, Minn. 55344.

Multiplexer Supports Controller In Providing Greater Port Count

ANAHEIM, Calif. — California Computer Products, Inc. (Calcomp) has unveiled a communications multiplexer that works in conjunction with the firm's Model 951/953 plotter controller to increase its maximum number of allowable data ports from one to four outputs.

All of the ports on the device, called the 4 to 1 Input Multiplexer, can be independently configured to accept serial data in Calcomp's 960 or 907 plotting formats.

Basically, the unit's priority scheme allows the user to select ports for preferential access, a spokesman pointed out.

The device will screen for any active ports to allow plotting to proceed or put other ports in a wait-state until a job is

completed, according to the firm.

The multiplexer also reportedly allows users to recover from host errors. Using a "dead host timeout," a port is automatically released if data is not received within a user-specified interval, the spokesman noted.

In addition, time intervals on the device are user-selectable, so the unit can be altered to accommodate various connecting devices and lines.

The 4 to 1 Multiplexer operates at communications rates of from 300 to 19.2K bit/sec. Since it is contained on a single board, the device can be installed in the field, a spokesman explained.

The multiplexer costs \$1,995 and can be delivered in 60 to 90 days from Calcomp, headquartered at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Decnet Users Get Controller to Access MVS-Based Files

FREMONT, Calif. — Interlink Computer Sciences, Inc. has announced an integrated hardware and software controller system that is said to allow users of Digital Equipment Corp.'s Decnet network to access MVS-based mainframe files.

Called System 3711, the device allows users on Decnet to retrieve information from IBM data bases down to the record level, without physically keying in IBM protocols and communications procedures, a spokesman said.

The system combines hardware — a network controller — and Decnet software with Interlink-designed host-resident software that functions in International Standards Organization Level 7, said to be the highest level of communications in a layered network architecture. The network controller actually functions as an intelligent front-end processor linked to the IBM system via a high-speed data communications channel.

The host-resident software — Master Control and Translator modules — reportedly allows DEC users to share information to and from IBM data bases.

Software features of the package include: dynamic file access at the record level, without entering batch mode and without need for JCL; data security via Cambridge Systems Group and IBM protocols; error messaging; and transparent data translation as well as support of multiple data records.

The System 3711, including the network controller hardware and IBM host-resident software, is priced from \$98,500. Shipments are scheduled to begin in January from Interlink at Suite 203, 39055 Hastings St., Fremont, Calif. 94538.

First Package in NDS-Series

'Multipoint Network Design' Fits IBM Micros

WEST BRIDGEWATER, Mass. — Connections, Inc. has announced Multipoint Network Design software, the first package in its NDS-Series for use on IBM Personal Computers and other microcomputers.

Designed to analyze performance characteristics such as response time, system utilization, topological configurations and cost variables of any size network, the software features English-language prompting with a hierarchy of commands and file structure.

The network data base is stored on diskettes, the vendor said.

Modeling and topological optimization are achieved by using queue-

ing models and linking algorithms, the company explained.

The software allows the user to define all network parameters, and a menu-driven screen lets the user build libraries of all variable proto-

cols and tariffs for modeling run comparisons, a spokesman said. The results of any network design can be compared graphically against other alternatives, and gross statistics on network traffic or application vol-

umes may be input.

Multipoint Network Design software costs \$3,500, the vendor said. Connections is located at 322 E. Center St., West Bridgewater, Mass. 02379.

Mobil Oil Inaugurates Instant Payment Plan

(Continued from Page 103)

into Mobil's account.

Mobil tested the system in the Tidewater region of Virginia in cooperation with Virginia National Bank, which operates the Cash Flow network switch, built around an IBM 370/158. The software to allow com-

munications between Mobil's terminal-to-Tandem system and the bank ATM networks was developed by Mobil.

Thomas Lewis, vice-president at Virginia National Bank, was manager for the Mobil test project and he told *Computerworld*, "We had two ob-

jectives, operational feasibility and customer acceptance. We were less concerned with the technical aspect. We're very pleased in both areas."

Manz said Mobil is already installing terminals in California and plans to move "as rapidly as we can" to complete installations at the 2,400 stations nationwide. The terminals are custom-made for Mobil by Data-trol, Inc. of Hudson, Mass., and will communicate over leased telephone lines to the switch, a Tandem Computers, Inc. Non-Stop II computer system.

The terminals will also process Mobil credit cards along with Visa and Mastercard credit cards.

While Mobil has 15,000 to 16,000 stations around the country, the terminals are being placed "in the 2,400 that are the high-volume stations that do a lot of credit card transactions and cover well over 50% of our gas operations," Manz said. Following California, installations will be extended next year to the Northeast, Florida and Texas.

Manz said it will take 60 to 90 days to "get the software in place and operating" at the Washington networks, at which point customers of member banks will be able to use their debit cards at any terminal-equipped gas station. He said the company will negotiate with other ATM networks in the areas.

Donald O'Connor, president of the EFT Group that operates Most through a switch maintained by NCR Corp., said the Mobil transactions will have little impact on the performance of the network. "It's certainly going to increase volume at the switch level, but it does not require any modifications. It doesn't look any different than an ATM transaction."

Virginia National's Lewis agreed. "There's some effort involved, but once it's up and running it's a typical day-to-day operation really," he said. Preparing for the actual machine-to-machine communication, he said, "is an interface project" establishing protocol flows and message flows.

Mobil's system took 2½ years to develop and was extensively field-tested, Manz said. Although automated fuel dispensers that accept debit and credit cards are presently being manufactured and installed around the country by several gas companies and computer equipment vendors, Mobil decided not to select that path for now.

"We had no problem with consumers using the card-activated pump, but we really couldn't justify the cost or see any economic benefit," Manz said. While conversion units to enable pumps to dispense automatically gas cost in excess of \$10,000, typical card terminals are selling for several hundred dollars.



Save money on your network by using less of theirs.

Ever get the feeling the phone company throws a party every time you add a line?

They should. It means a lot more money for them. And a lot less for you.

But our statistical multiplexers can change all that.

They allow from three to 52 asynchronous terminals to

communicate error free and cost efficiently over a single telephone line.

So, if the thought of giving the phone company a lot less money appeals to you, call us (collect, of course) at 401-885-4840.

In the meantime, if you hear from you-know-who, just tell 'em to hold the phone.



Comes in three models: 3-9 channels—DM 900, 4-16 channels—DM 1600, 4-52 channels—DM 4800.

Variable concentration ratio—up to 1200%.

Has a supervisory console port.

Can be configured at either end and

down line loaded.

Programmable flow control characteristics.

Works with any asynchronous device.

Uses only straight through cables.

Works with any phone line.



Datagram

We're taking a bite out of Ma Bell.

Before you get hitched to a computer printer, make sure it comes from a good family.



Back when punched cards were the height of high-tech and Apples were baked into pies, Dataproducts began selling computer printers to companies that re-sold them as part of their computer systems.

We still sell most of our printers this way. The leaders in the computer business are our best customers.

As you would expect, they are very choosy about what goes out with their name plates attached.

Our printers must be extremely reliable, high

performance machines in order to pass

muster. They are. The result is we've

become the largest company in our industry, mainly by selling products with other people's names on them.

Nobody puts words on paper so many ways.

Or charts, graphs and diagrams. Bar codes and color illustrations. Virtually any idea that can be described by a computer can be printed by a Dataproducts printer.

We make serial matrix printers that

can "paint" a picture with thousands of tiny dots. And highspeed word processing printers that whisk out letters as sharp as the finest office typewriters.

We make ruggedized and high-security printers for the government. Special encoding printers for financial companies. Low cost, personal computer printers for homes and offices.

Our line printer technology is so superior, some people buy the printing mechanism and build their own printers around it.

We make excellent quality ribbons and other supplies for all our printers and for other manufacturers' printers as well.

And we maintain an international service organization to support every product we sell.

Experience.

Still the best teacher.

Over the years, we've learned more about computer printers than anybody. We know how people kick cabinets, yank paper and tangle ribbons. We engineer our printers to be easy to use.

We make them smaller, faster and quieter than ever. And while they are the most reliable machines in our family's long history, today's Dataproducts printers are also the most affordable to own.

Chances are there's at least one Dataproducts printer that fits your needs exactly.

Write us at 6200 Canoga Avenue, Woodland Hills, CA 91365. Or phone (213) 887-3924.



DATAPRODUCTS

The Printer Company



Features Autospeed Capability Limited-Distance Modem Unveiled

CHERRY HILL, N.J. — Datatel, Inc. has unveiled a limited-distance modem that is geared for use in close communications applications where transmission distances are short.

The DCP3055 features an autospeed capability, reportedly giving it some advantages in statistical multiplexing and tail-circuit applications. The limited-distance modem, working at a remote multiplexer, is designed to sense any operator changes on communications lines and adjust the line speed accordingly.

A similar unit at the end of the tail circuit also senses any line-speed changes and will alter its operating speed, a spokesman claimed.

Used With DCP3050

The DCP3055 can be used in conjunction with the firm's DCP3050, which is similar to the first unit but does not have the autospeed capability. Instead, this unit provides for speed selection via a front-panel rotary switch.

A typical application would have the 3050 at a central computer site transmitting to an autospeed 3055 at



Datatel's DCP3055

an unattended remote site. The remote unit would change line speeds automatically in response to changes made on the local unit, the spokesman claimed.

The DCP3055 operates at speeds from 1,200 to 19.2K bit/sec, in both synchronous and asynchronous applications. Asynchronously, it will reportedly operate at speeds up to 64K bit/sec.

It also provides full-duplex transmission over four wires, at ranges depending on the data rate and wire

size, the spokesman added.

The unit appears as an RS-232C interface to the user's computer or peripheral and conforms to Bell Publication 43401 requirements.

Other features include built-in diagnostics and front-panel indicators. The unit is available in a module version for installation in a Datatel equipment nest, the spokesman explained.

Prices for the DCP3055 range from \$440 to \$550, depending on quantity. Additional details on the device can be obtained from Datatel.

Datatel is located at Pin Oak & Springdale Roads, Cherry Hill Industrial Center, Cherry Hill, N.J. 08003.

Net System Gives Users Access to Files

CONCORD, Mass. — Xyplex, Inc. has introduced a terminal switch and front-end networking system said to provide users with access to computer files while reducing direct wiring requirements.

The system includes an XP-UN64-A Unibus host interface unit for Digital Equipment Corp.'s VAX-11 and PDP-11 minicomputers running DEC's VMS or RSX operating systems and the XP-CC8-A terminal-cluster controller, providing connections for up to eight terminals.

Within a local environment, a single cable can reportedly be used to connect terminals and computers, allowing a user to access the computers or other terminals.

System management functions are said to be integrated into the computers with host interface units, including system performance information, configuration data bases and diagnostic tools.

The host interface unit is priced at \$9,500, and the cluster controller costs \$5,600 from Xyplex at 100 Domino Drive, Concord, Mass. 01742.



Send more Information on:

- ☐ **PCI 1076:** ASCII to SNA/SDLC 3270 emulation.
- ☐ **PCI 1051:** ASCII to Sys 34/36/38 5251 emulation.
- ☐ **PCI 1067:** SNA/SDLC to ASCII 3767 emulation. The NTO alternative.
- ☐ **PCI 71B/SNA:** BSC 3271 to SNA/SDLC 3274 emulation.
- ☐ **PCI 75B/SNA:** BSC 3275 to SNA/SDLC 3276 emulation.
- ☐ **PCI 1071:** ASCII to BSC 3270 emulation.
- ☐ **PCI 3780/SNA:** SNA/SDLC to BSC 3780 emulation.
- ☐ **Videotex 67:** SNA/SDLC to Videotex protocol conversion.
- ☐ **PCI's X.25 Series:** PCI 73SX and PCI R73SX, SNA/SDLC to X.25 protocol converters for host and terminal connections respectively; PCI 1076X, ASCII to 3270 SNA/SDLC through X.25 networks, PAD included.
- ☐ **PCI's Networkers:** Keystroke for keystroke 5251/11 and 3278 keyboard compatible ASCII CRT's.
- ☐ **PCI's IBM-PC software packages:** For 3270 and System 34/36/38 emulation.
- ☐ **PCI's Personal Computer Support book.**

Name/Title

Company Name

Address

City

State

Phone

The Micro Mainframe Link

Making the non-IBM world IBM compatible.

PCI PROTOCOL COMPUTERS, INC.

6150 Canoga Avenue
Woodland Hills, CA 91367-3773

(800) 423-5904
(213) 716-5500 in California
TWX 9104945941 PCI WHQ

Bell-Compatible Modem Introduced by Gandalf Data

WHEELING, Ill. — Gandalf Data, Inc. has introduced the second modem in its synchronous/asynchronous Bell-compatible modem line.

The SAM 201 is a 2,400 bit/sec modem designed for switched network, unconditioned, 3002-type lines or two- or four-wire voiceband private lines.

Unlike other Bell-compatible 201C modems, the SAM 201C operates in synchronous and asynchronous modes. In the synchronous mode, the SAM 201 is compatible

with other 201C and CCITT V.26 Option A and B modems. In the asynchronous mode, the SAM 201 communicates with another SAM 201 modem.

SAM 201 features a built-in, auto-answer for use on the switched network. It can also be used with an 801-type auto-dialer. Both rack-mount and stand-alone units are available.

Stand-alone units are priced at \$725. More information is available from Gandalf Data at 1019 S. Noel, Wheeling, Ill. 60090.

IBM® 3270 Users.

Before **After** **Fibronics Cable Bandit**

coax fiberoptic or coax

IBM } A & B Adapter
ITT }
Raytheon }

Fibronics International Inc.
fiberoptic communications

218 West Main Street • Hyannis, MA 02601 • (617) 778-0700 • Telex 951297

HP Interface Kit Connects to Net

PALO ALTO, Calif. — Hewlett-Packard Co. has announced an interface kit that allows the HP 4955A protocol analyzer to connect physically to an Ansi X.21 public network.

The interface kit, HP 18138A, provides a cable with X.21 15-pin connectors for use with the vendor's RS-449 interface pod, the HP 18136A, for the physical connection.

Included in the kit is display software allowing simultaneous viewing of both character- and bit-oriented protocols, which is said to expand the problem-solving capability of an HP 4955A user.

The HP 18138A interface kit is priced at \$250 and must be used with the HP 18136A interface pod, priced at \$950.

More information is available from HP at 3000 Hanover St., Palo Alto, Calif. 94304.

If you want ASCII graphics terminals on IBM networks, PCI speaks the language.

Thanks to PCI's protocol converters, the PCI 1076 and PCI 1071, your graphics problems are over. There's no more plotting in slow motion. No more translate tables causing stray vectors on your plots. And no more handshaking hangups. PCI lets you attach ASCII graphics terminals (Tektronix, Ramtek, HP, etc.) and plotters to a SNA/SDLC line so they appear as SNA devices to the host.

You don't have to modify VTAM/NTD or translate tables to support graphics. You don't even have to buy NTD.

And PCI converters will operate with SAS/GRAPH, PLOT-10, DISSPLA, TELL-A-GRAF, DI 3000, and many other graphics software packages – through the same protocol converter that supports your non-graphics terminals. So they're very fluent, graphically speaking.

PCI's 1076 and 1071 protocol converters move your graphics devices into the fast lane; they'll run at up to 9600 bps. PCI allows ASCII graphics equipment to attach to your IBM system as 3278s or 3287 terminals and printers – instead of much slower TTYs. So your IBM host can communicate

with the protocol controller using more efficient, high speed, asynchronous SDLC or BSC line disciplines.

In addition, PCI protocol converters allow your ASCII terminals to emulate 3270 full screen operation. So you can access SPF, full screen editors and any utilities available to a 3270. Which means more productive use from your graphics hardware, even when it's not doing graphics.

There are a lot more graphic examples of what PCI protocol converters can do for your graphic devices. So if you've been having communications problems with computer graphics on your IBM system,

let PCI speak your language. Call for a demonstration today.

For more information call today, **(800) 423-5904**, **(213) 716-5500** in California, TWX 9104945941 PCI WHQ. Or write PCI, 6150 Canoga Avenue, Woodland Hills, California 91367-3773.

Pci **PROTOCOL**
COMPUTERS, INC.

See us at Comdex, Booth No.'s 3561, 3562, 3661, 3662.

AND IT WORKS
LIKE A
3270, TOO!

GRAPHICS
AT 9600
bps-



Videtoex News Service Out

OLATHE, Kan. — Harris Electronic News has announced a Kansas City, Kan.-based videotex service that will offer more than 1,000 items of information including business news, local Kansas City news, weather, sports and entertainment.

The News will also feature hourly updates on Wall Street activity, including Dow Jones averages, Standard & Poor's Register of Corporations and other market indexes. It will update more than 250 stocks four times a day. Other information will include Treasury bill rates, ex-

change rates, certificate of deposit rates, metals cash-and-futures prices and columns on investments and technology in business.

A home or business computer will allow subscribers to gain access to the computer-based information system.

The price for the service ranges from \$5 to \$15, depending on which information a user accesses from the data base. More information is available from Harris Electronic News, 514 S. Kansas, P.O. Box 124, Olathe, Kan. 66061.

Operating System Unveiled For Microcomputer Nets

(Continued from Page 103)

monitoring device meant to restrict simultaneous use of network applications programs.

At a press conference held recently, Joseph Hughes, marketing vice-president at San Jose, Calif.-based Corvus Systems, announced that his company had signed a letter of intent with Softech to distribute the network software as an option on its Omni-Net hardware. In addition, fu-

ture versions of the network code will be made available for networks by Nestar Systems, Inc. and Xerox Corp., Softech said. The operating system costs \$700 for an eight-user installation and \$2,000 for a 24-user site. Deliveries are slated to commence in late February of next year.

Softech Microsystems is based at 16885 W. Bernardo Drive, San Diego, Calif. 92127.

To all reps: Price changes on following items effective immediately:
No. 10-11A, 10-114A, 10-AL.

Chris: The latest offer looks better, although it's still not what we were hoping for. Try for another compromise.

Just got the word from Gary. Increased our share by 6%. If trend holds, we'll pass competition by third quarter!



Smartcom II communications software, currently available for IBM PC, DEC Rainbow 100, Xerox 820-II and Kaypro II.



Smartmodem 1200 for all computers with an RS-232C interface; Smartmodem 1200B plug-in board for the IBM PC.

Microcomputer communications? Get control of the situation with Hayes

Microcomputer communications can present the DP/MIS staff with a tangle of mis-matched hardware, user-hostile software, and a situation that can quickly get out of hand.

Hayes can help you avert that chaos, with a telecomputing system designed expressly for microcomputers.

A system so advanced, it's downright simple. Economical. And requires no handholding from you.

Hayes. The computer's telephone. Our Smartmodem 300™ and Smartmodem 1200™ connect to any desktop computer with an RS-232C port. They operate with rotary dial, Touch-Tone® and key-set telephone systems. At full or half duplex. And both feature self-test capabilities, as well as indicator lights and built-in speakers for monitoring calls.

The lower-priced Smartmodem 300 is ideal for local data swaps and communicates at 300 bps. A built-in speed selector on Smartmodem 1200 automatically detects transmission speeds (110, 300 or 1200 bps).

Smartmodem 1200B™ is also avail-

able as a plug-in board for IBM® Personal Computers. And Hayes manufactures the Micromodem IIe® for Apple® II, III, IIe and Apple Plus computers, as well. It comes packaged with Smartcom II™ communications software.

Speaking of software, more programs are written for Hayes modems than for any other. And that impressive list includes our own incomparable communications software. Smartcom II™ Complete, menu-driven software for the IBM PC, DEC Rainbow 100™, Xerox 820-II™ and Kaypro II™. Even first-time communicators will find success with Smartcom II. Screen prompts guide users in the simple steps it takes to create, send, receive, list, edit, name and re-name files.

Tasks like simultaneously receiving, printing and storing data—completely unattended—are easily managed with Smartcom II, because it takes full advantage of Smartmodem's capabilities.

The program reduces lengthy dial-

up and log-on sequences to a single keystroke. It stores communications parameters for 25 remote systems.

Plus, there's an on-line help feature that explains prompts, messages and parameters.

Our reputation speaks for itself. Hayes has five years of solid leadership in the microcomputer industry. Nationwide availability through retail computer stores. Trouble-free factory service and call-in assistance. A limited two-year warranty on all hardware. And the most efficient telecomputing system available. Anywhere.

If you're involved in linking micros or setting standards for configurations, remember this. Everything your people need to know about communications can

Hayes be summed up in one word: Hayes.

Hayes Microcomputer Products, Inc., 5923 Peachtree Industrial Blvd., Norcross, GA 30092. 404/441-1617.

Micromodem IIe is a registered trademark of Hayes Microcomputer Products, Inc.
Smartmodem 300, Smartmodem 1200, Smartmodem 1200B, Smartcom I and Smartcom II are trademarks of Hayes Microcomputer Products, Inc.
Touch-Tone is a registered service mark of American Telephone and Telegraph.
IBM is a registered trademark of International Business Machines Corp.
Apple is a registered trademark of Apple Computer, Inc.
DEC Rainbow 100 is a trademark of Digital Equipment Corporation.
Xerox 820-II is a trademark of Xerox Corporation.
Kaypro II is a trademark of Non-Linear Systems.
Z8 is a trademark of Zilog, Inc.
©1983 Hayes Microcomputer Products, Inc.

Smartmodem Specifications:
Low Speed Data Format: (Smartmodem 1200 and Smartmodem 300) Serial, binary, asynchronous: 7 or 8 data bits: 1 or 2 stop bits: odd, even or no parity (0-300 bps).
High Speed Data Format: (Smartmodem 1200) Serial, binary, asynchronous: 7 data bits: 1 or 2 stop bits: odd, even, or fixed parity or 8 data bits: 1 or 2 stop bits: no parity (1200 bps).
Dialing Capability: Touch-Tone® and rotary-dial pulse dialing.
Command Buffer: 40 characters.
Commands: (unnecessary with Smartcom II software) A: Immediate answer. AI: Repeat last command. C: Transmitter Carrier. D: Dial command, including simple dialing, waiting for second dial tone, auto-dialing and other features. E: Local echo. F: Full/half duplex. H: Switch hook. M: Audio monitor. O: On-Line. P: Pulse dialing. Q: Quiet mode. R: Reverse originate/answer mode. S: 17 "Set" commands speed, escape code character, number of rings to answer on, etc. S: Checks operational parameters above. T: Touch-Tone dialing. V: Verbal result codes.
Result Codes: (can be numerical/verbal): 0/OK: Command line ok. 1/Connect: Carrier detected. 2/Ring: Phone is ringing. 3/No Carrier: Carrier lost or never heard. 4/Error: Error in command line. 5/Connect 1200: Carrier detected at 1200 bps. (Smartmodem 1200 only.)
Audio Monitor: Two-inch speaker with volume control.
Rear Panel: On-off switch, power jack, RS-232C connector, modular phone jack connector, volume control.
Operation: Full or half duplex.
Data Rate: 0-300 bps and 1200 bps for Smartmodem 1200; 0-300 bps for Smartmodem 300.
Interface: RS-232C.
Intelligence: Z8™ microprocessor with 4K byte control program for Smartmodem 1200; Z8 microprocessor with 2K byte control program for Smartmodem 300.
Modem Capability: Bell System 103 or 212A compatible originate or answer mode for Smartmodem 1200; Bell System 103 compatible originate or answer mode for Smartmodem 300.
Receive Sensitivity: -50dBm for Smartmodem 1200; -45dBm for Smartmodem 300.
Transmit Level: -10dBm.
Registration: FCC registered for direct-connect to the nationwide phone system. Connects with modular jacks RJ11W, RJ11C, RJ12W, RJ12C, RJ13W, RJ13C.
Power Pack: U.L. listed 120VAC, 60Hz. 13.5VAC output.
Size: 1.5" x 5.5" x 9.6"

Response Time Analyzer Out for IBM Net Users

EAST NORWALK, Conn. — A data collection instrument that measures performance levels and the efficiency of IBM data communications networks has been announced by Datacomm Management Sciences, Inc.

The RTA-327II response time analyzer was designed to be used with IBM Binary

Synchronous Communications or Synchronous Data Link Control/Systems Network Architecture protocols and can operate with IBM 3271, 3274, 3276 or equivalent terminals.

The unit permits simultaneous measurements of user-perceived response time; host and polling delays; traffic loading; and other significant parameters that impact overall system performance, a spokesman said. The device can measure the performance of an entire circuit, or it can be selective to a specific controller, terminal or software application package via a trapping capability, the spokesman said.

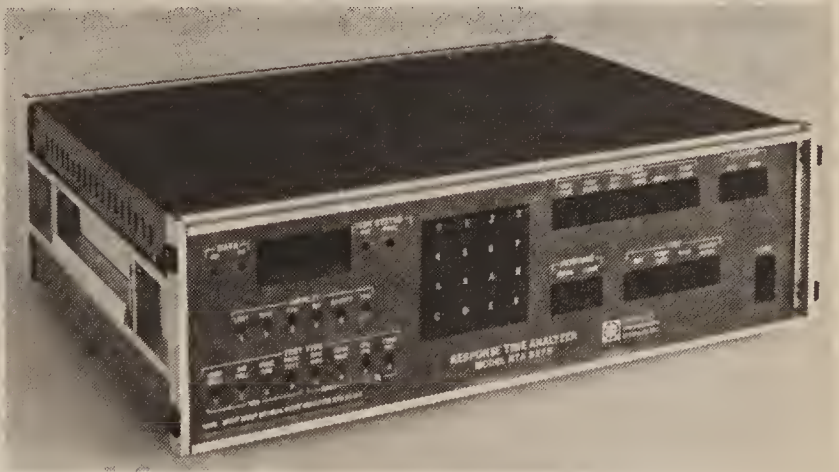
By using the device, a network manager can see system responses and delays as a user would and take the appropriate actions to keep network performance up and costs to a minimum, the spokesman claimed.

All network measurements are made at the CPU site or optionally at a remote location.

Performance data is measured and analyzed simultaneously, with each measure-

ment report time stamped and routed to the test output. The analyzer costs \$4,875

from Datacomm at 25 Van Zant St., East Norwalk, Conn. 06855.



Datacomm Management's RTA-327II

NOW! PLUG INTO IBM 3274/6 COAX WITH ASYNC ASCII DEVICES

Examples: Mini/Micro Computers, Modems, Port selectors

VIA INTERLYNX™/3278

- Async ASCII to IBM Type A coax conversion.
- 3278 native mode emulation with P.C.'s, async CRT's or hardcopy terminals.
- Use same ASCII terminal on IBM and async network.
- Local or remote BSC/SNA attachment.
- Async dial support on channel-attached IBM 3274.
- File transfer package for IBM PC (\$200).
- 25 primary async ASCII terminals supported, 50 secondary terminals.
- PC support for IBM PC (\$60), HP-120/125, Apple II/III, Compaq, Xerox 820, VT-180, Rainbow, Osborne, TRS80 II, etc.
- Menu selection of 3278 async pass-through and configuration mode.
- Options stored in electrically erasable PROM.
- User-initiated disconnect for Micom or Develcon switch.
- Word processor support for Xerox 860 and IBM Displaywriter.
- \$1,395 (\$995 for 25 or more.) Dealer and OEM discounts available.

LOCAL DATA
2701 Toledo St. (213) 320-7126
Torrance, CA 90503 TELEX 182518

Service Links 3270 Users To Telenet

VIENNA, Va. — GTE Telenet Communications Corp. recently announced a service enabling IBM 3270 terminal users to access asynchronous host computers connected to the Telenet data network.

GTE Telenet Interface Program (Gtip) reportedly combines an IBM-based application program with a Telenet network interface, enabling local and remote 3270 terminals to establish switched connections through their host computers to any other asynchronous host application on the network. The service is available for any IBM 370, 4300 series, 3030 series or 3080 series mainframe system with an MVS operating system.

Gtip functions with both Binary Synchronous Communications and Synchronous Data Link Control 3270 terminals and is fully compatible with IBM's Systems Network Architecture (SNA) and non-SNA systems, a spokesman said.

The service is available for a \$300/mo incremental charge above the normal Telenet service rate for a leased line connection between the customer host computer and Telenet. More information is available from GTE Telenet, 8229 Boone Blvd., Vienna, Va. 22180.

Applications Software Developers

How Whitesmiths' better system software can help you build a better bottom line.

The portability of Whitesmiths' C Compilers and Idris operating system enables you to offer your applications to a wide range of end-users without reworking your code. Just one development effort works on many architectures, because Whitesmiths' C Compilers span over 30 systems, and Idris, the most complete and portable UNIX-like system for micros, is UNIX-compatible in both directions. You can also lower costs and simplify distribution by eliminating end-users licenses using Whitesmiths' new "licensing under copyright" Authorization Seal.

SEND FOR OUR FREE BOOKLET "THE PROFIT BUILDERS' CHECKLIST"

Our new booklet gives you a quick and easy way to check the benefits of Whitesmiths' products for your operation. See for yourself how we can cut your costs, widen your markets, and build your bottom line.

Whitesmiths, Ltd.
97 Lowell Road
Concord, Mass. 01742
(617) 369-8499

Idris is a trademark of Whitesmiths, Ltd.
UNIX is a trademark of Bell Laboratories.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
TELEPHONE _____

WHO LEADS THE FIELD IN DESIGN & CONSTRUCTION OF HIGH-TECH SITES?

COM-SITE INTERNATIONAL: THE SINGLE SOURCE SOLUTION

Design and Construction Services Include:

• Site Planning	• Access Flooring
• Hardware Configuration	• Fire Suppression
• Environmental Control	• Security Systems
• Electrical Systems	• EMI/RFI Shielding
• Architectural Systems	• As-Built Drawings

THE METHOD MAKES IT WORK!

Fast-Track Performance & On-Time Completion

COM-SITE INTERNATIONAL
1-800-638-3195
In Maryland call (301) 937-1730

9600bps MODEM \$167.*

If you just want to run your data down the hall, or down the street, then the Z9600 Series of Short Haul Modems are just what you need.

Up to 9600 bps, up to 10 mile range, self test, transmit and receive indication, and optional rack mount version.

Want more information? Call or write us now for a data sheet and complete pricing. (We have generous discounts for quantity buyers).

MADZAR CORPORATION
37490 Glenmoor Drive
Fremont, CA 94536
415/794-7400
*Single Unit Price

There isn't another in the world able to as advanced as For five go

1. The Millennium environment is borderless.

Unlike any other company's software packages, Millennium packages aren't walled off from each other by separate programs and commands. So you can cross instantly from one system to the next. You can ask a question in general ledger, immediately seek an answer on-line in accounts payable, and follow the track wherever it leads. Into fixed assets, purchase order management, anywhere. While traditional packages force you to work within the narrow confines of a given application, Millennium creates a limitless environment that enables you to access applications at will. With a single key, you're free to explore the vast entirety of your information universe. No other system works like Millennium, except your own mind.

2. Millennium has common functions across all applications.

Let's say you have a half dozen different packages. General ledger, accounts payable, and so on. In the

past, that meant doing everything a half dozen times. Learning the different programs and commands for each application. Training users in data entry procedures for each one. From a training and service standpoint, Millennium is infinitely less complicated because the same set of functions governs all applications. You use, for example, the same real-time update procedures for accounts payable as fixed assets. Functions never change, only the data that defines the particular application. Once you learn one set of functions, you've learned them all. And you quickly find you're faced with a much lighter load of training, documentation and support requirements.

3. All Millennium systems are real-time, on-line.

Working in the borderless environment, you perform routine file maintenance on the spot as you cross from system to system. You can update fields, records or any other information in your files instantly. There's no waiting for batch processing. You get accurate, up-to-

software company give you anything Millennium. od reasons.

the-second information the moment you need it.
Today, not tomorrow when it's too late.

4. All Millennium systems are secure and friendly.

Although Millennium is borderless, the security is tighter than any border patrol. Totally comprehensive and user defined. You can set up any restrictions you want, right down to the field level.

Even the on-line HELP feature in Millennium is user-defined. Not only do you get comprehensive on-line documentation from McCormack & Dodge. But you're able to enter your own specific instructions and requirements on-line into the HELP data base, exactly the way you want them. This gives you complete flexibility to define corporate policies and procedures.

Millennium has a special ScreenPaint function that lets you design your own terminal screens quickly and easily. You can see and use your new screen format in a matter of seconds.

5. Millennium offers an interactive PC link.

This gives you an enormously powerful and effective managerial tool. Without leaving your desk, you can open up your mainframe to the analytical powers of your personal computer. You can selectively download specific data from the mainframe and study it, manipulate it and graph your results. When you've finished you can upload the data back to the mainframe in minutes.

Clearly, Millennium is the software of tomorrow. But only McCormack & Dodge can install it today.

Introducing Millennium. Tomorrow's software today.

- | | |
|---|--|
| <input type="checkbox"/> General Ledger | <input type="checkbox"/> Payroll/Personnel |
| <input type="checkbox"/> Accounts Payable | <input type="checkbox"/> Purchase Order Management |
| <input type="checkbox"/> Fixed Asset Accounting | <input type="checkbox"/> Capital Project Analysis |

1-800-343-0325*

* Telex 174002

McCormack & Dodge

DB a company of
The Dun & Bradstreet Corporation

support offices throughout North and South America, Europe, Asia, Australia and Africa.

Communications Processor Emulates IBM Controllers

MIAMI — Innovative Electronics, Inc. has announced a communications processor said to emulate an IBM 3271, Models 1 and 2, IBM 3274-51C and IBM 3276, Models 1 and 2, communications controllers.

The MC-80/602 processor reportedly converts a keyboard send/receive device or an asynchronous Ascii host into a full-function IBM 3277-1, 3277-2, 3278-1, 3278-2 terminal communicating with the IBM host using the IBM Binary Synchronous Communications protocol.

A switch selection is said to allow the MC-80/602 to communicate with an asynchronous Ascii host for file transfer, with a blocking feature

built into the MC-80.

Priced at \$1,650, the processor is available from the vendor at 4714 N.W. 165th St., Miami, Fla. 33014.

Net Said to Handle 10 Workstations

WINTER PARK, Fla. — Control Electronics, Inc. has announced a networking system said to handle up to 10 workstations, each with its own Zilog, Inc. Z80A or Z80B processor and 64K bytes of internal memory.

Control/Net is said to operate under the Turbodos operating system, which is compatible with Digital Research, Inc.'s CP/M operating system. Control/Net reportedly in-

Mark XII Modem Unveiled

VAN NUYS, Calif. — Anchor Automation, Inc. recently announced a modem that emulates the command structure of the Hayes Microcomputer Products, Inc. Smartmodem.

The Mark XII modem reportedly

can be operated manually through a keyboard without computer coding or automatically to answer and originate calls at 1,200 bit/sec for Bell 212A compatibility and up to 300 bit/sec for Bell 103, according to a company spokesman.

The unit detects dial tone and busy signals, automatically displaying dialing status on the CRT. The spokesman said an on-board complementary metallic oxide semiconductor microcomputer results in low power consumption and a high degree of reliability.

The device uses a standard RS-232 serial interface with built-in cable, comes equipped with two telephone jacks and cord and is directly connected to a wall telephone outlet.

The Mark XII is available for \$399 from Anchor Automation, which is located at 6913 Valjean Ave., Van Nuys, Calif. 91406.

Ascii Terminal Features 12-In. Display

SAN FRANCISCO — Liberty Electronics has announced a visual display terminal said to include a high-resolution, nonglare, 12-in. diagonal screen display, user-programmable features and nonvolatile memory.

The Freedom 200 Ascii terminal is said to offer eight foreign character sets, a standard low-profile keyboard, nonembedded character attributes for both visual display and data entry, double-high and double-wide characters and 86 extended graphics characters.

Priced at \$745, the terminal is available from Liberty Electronics at 625 Third St., San Francisco, Calif. 94107.

DMS-816 Touts Compatibility With IBM Micro

OAKLAND, Calif. — Digital Microsystems, Inc. has announced the availability of a workstation said to be compatible with the IBM Personal Computer.

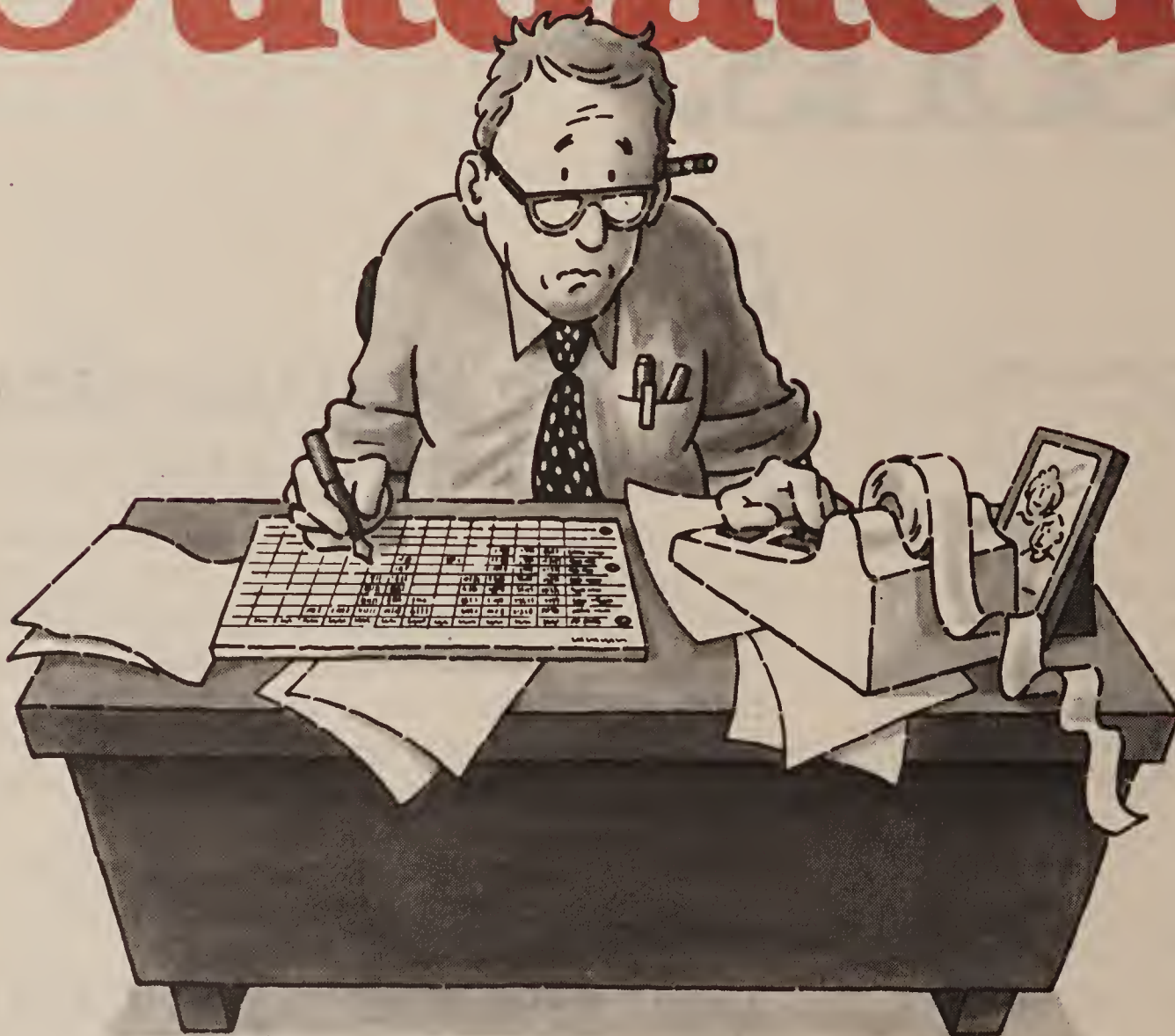
The DMS-816 workstation allows users to run either IBM's MS-DOS or Digital Research, Inc.'s CP/M operating system on the vendor's Hinet local-area network, a spokesman for Digital Microsystems said.

The DMS-816 reportedly duplicates the functions of IBM's read-only memory for I/O, an IBM-compatible monochrome video display and a keyboard with all the functions of the Personal Computer.

The DMS-816 features an integrated 12-in. video monitor and detachable keyboard, as well as dual microprocessors, 256K bytes of random-access memory, a 19.2K bit/sec RS-232 printer port and a parallel port, according to the spokesman for the firm.

Priced at \$1,695, the DMS-816 is currently available from Digital Microsystems, which is headquartered at 1755 Embarcadero, Oakland, Calif. 94606.

Outdated.



This dedicated employee can't adapt to an automated office. DELTAK CAN HELP.

Meet Harry. He's one of your company's best workers. Honest. Hardworking. Reliable. Trouble is, Harry's behind the times. His job skills are antiquated in today's computerized office.

Harry needs rapid retraining to fit into this new business environment. So do millions of other loyal employees like him. But how can they acquire the critical skills they need? DELTAK has the tools to help.

You see, we offer over 250 multimedia and computer-based courses teaching job-specific skills—word processing, computer literacy, basic

DP concepts, using personal computers, computer programming—the list goes on and on. These courses have been specifically developed to ease employee anxieties, and help them take advantage of productive new office technologies.

Why DELTAK? Because we're the world's leading producer of multimedia and computer-based training. So we have what it takes to keep your people informed and productive.

For more information, call or write DELTAK today.

And start updating Harry tomorrow.



DELTAK

East/West Technological Center
1751 West Diehl Rd., Naperville, IL 60566
(312) 369-3000 (800) 532-7686

Now you don't have to be rich to be powerful.

Riches and power don't always go together. Take Plexus, for instance. The world's most powerful UNIX*-based supermicros.

Powerful because multiple processors share the UNIX load. So processing power is distributed to where it does the most good.

Terminal I/O. Disk I/O. Data communications. And, of course, data processing.

Our unique architecture also lets us bring you the world's first UNIX Network Operating System (NOS). So you can combine Plexus systems in an Ethernet network for even more power.

NOS gives you real time, continuous access to files. From anywhere in the network.

Files are also updated on the same basis. So everyone in the network works with up-to-the-minute data. Automatically.

No waiting for file transfers. And that's a decided improvement over everything else that's out there.

You also get to save money on powerful UNIX-based software, including COBOL, FORTRAN, Pascal, BASIC, and C. Database management and word processing, too. As well as hundreds of third party UNIX packages.

Plus our own software and main-

tenance support. And even a software referral service for your OEM programs.

Does all this make us expensive? Absolutely not.

In fact, Plexus systems cost thousands of dollars less than the minicomputers we outperform.



To get a better idea of just how good that performance is, come get a demonstration. Call 800-528-6050, ext. 1444. In Arizona, 800-352-0458, ext. 1444. Or write Ralph Mele at Plexus Computers, Inc., 2230 Martin Avenue, Santa Clara, CA 95050.

You see? You don't have to be rich to be powerful. Just smart.

PLEXUS
Built for speed.

See us at Comdex Booth #2148.

GONE BUT NO

Message Center - btl

From : message-center 4605

Mgs for harty, steve

Information for callers:

IN MIAMI FROM 5/9 THROUGH 5/12 AT

FOR BRIAN QUINN: NEED CONTRACTS

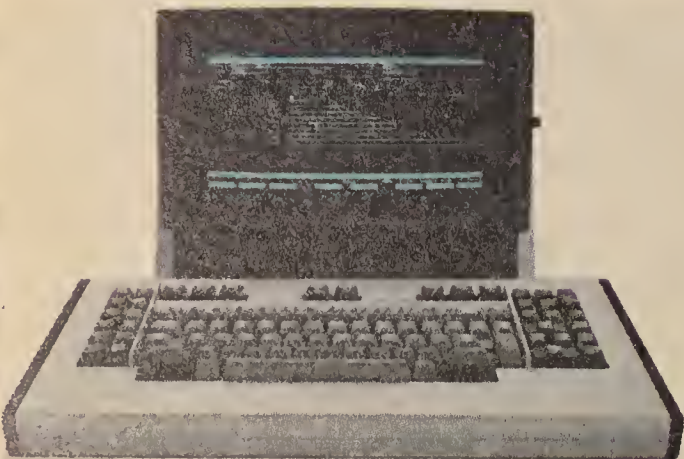
FOR NANCY: YOUR TICKET IS AT TRA

From: QUINN, BRIAN

Msg:

CONTRACTS SIGNED. COPIES BEING S
HOPE YOU GET A SUNBURN.

Tue May 10 08:58 am - btl



Message Center/Directory from AT&T Information Systems displays visible proof that you can be out of town, out of the office,

but never out of touch.

It will *never* forget you.

It's a personalized call coverage and information system. With it, one trained attendant can act as a backup personal secretary to you and 149 other busy managers.

Calls to unanswered or busy phones are automatically routed to the Message Center attendant. The display lets the attendant know where you are, why you're there, for how long, how you can be reached—or anything else you want to leave as a message.

You can retrieve your messages three

ways: from a display unit, on electronically-printed hard copy, or with a call to the attendant.

The Directory function adds to Message Center. It's an on-line database that gives you continuously updated information about fellow employees. Information such as name, extension number, location, title, department, and up to ten other fields of information.

The result? Vastly improved call coverage, better information flow, no unanswered phone calls, no missed messages, *no more pink slips*.

NOT FORGOTTEN

Password: condor Extension: 4150

SALES MEETING (305) 555-8652.

APPROVED AND SENT ASAP.

AGENT FOR PICK-UP. 999-4132.

Phone: 4289

OVERNIGHT MAIL TO HOTEL.

©1983 AT&T Information Systems UNIX—a trademark of AT&T/Bell Laboratories

Message Center/Directory is just one of several office management applications available on DIMENSION® 600 and 2000 systems and the new System 85. You can hook up a few individuals or your entire company. It's your choice.

System components and features are customized to fit your needs.

The *Information Controller* is the switching hub of the system. It is connected to the *Applications Processor*, a fast, powerful minicomputer with software that supports several new user-controlled applications.

Its UNIX™ operating system creates a fully interactive multi-user environment.

You can attach any combination of peripheral devices: voice-only terminals, voice terminals with 40-character displays, data terminals with full CRT screens like the 500 BCT pictured above, or new intelligent terminals that combine voice and data functions in an integrated workstation. And there's a full line of printers.

Message Center/Directory was developed by Bell Labs systems designers who now work for AT&T Information Systems

Laboratories. Built by AT&T Western Electric and maintained by the largest service organization in the industry, it's part of a fully integrated product line designed to help your business do business better.

That's our message loud and clear.

To find out more, call toll-free 1-800-247-1212, Ext. 879M.



AT&T
Information Systems

Only Lee Data's Universal Terminal System can satisfy all of your information processing needs...

3270, Async and personal computing.

Finally, there's a single, universal way to satisfy the individual information processing needs of all your people. From sales manager to accountant. From research to production. The Lee Data Universal Terminal System can do it all.

And our system is modular by design to provide you any or all of these cost-effective, problem-solving advantages:

3270-compatibility plus more

Combine complete 3270 system-compatibility with an innovative Lee Data design and you have a System that delivers greater convenience and flexibility.

Our System not only offers standard 3274-compatible local and remote control units, but now also provides combination local/remote controllers with a unique dual-host access capability.

In addition, you can choose from a full line of terminal capabilities, beginning with our cost-effective 3178-compatible display on up to our popular All-In-One Display which offers, in a single unit, four selectable screen sizes—including 132-column—a great advantage in program development, spread sheet applications and many others where flexibility is required.

3270-plus-Async: another cost-effective advantage

If your application needs currently find you switching between 3270 and VT100-style terminals to get the job done, Lee Data has a better way.

As part of our System, you can enjoy the further advantage of a 3270/Async capability that allows dynamic selection of 3270 and VT100 operating modes from a single Lee Data display. A simple command entered at the keyboard provides you access to applications

running on an IBM CPU, non-IBM systems (such as DEC, H-P or Prime), as well as timesharing services. Another Lee Data solution to simplifying your company's terminal network.

And now integrated personal computing too

That's right! Now our System also includes a sophisticated personal computing package that can easily be integrated into an existing Lee Data 3270 system.

With our approach, you get continued interactive access to host-based files, plus all the advantages of

professional business computing from the same Lee Data workstation.

Advanced features include a host file transfer capability, a single-board design, four standard system expansion slots and, of course, complete IBM-compatibility.

All these additional capabilities plus the same user-friendly Lee Data displays.

Plus these added benefits...

To any Lee Data System, add our unique Coax Eliminator products and realize additional savings of up to 85% in cabling costs alone.

Combine this with all the outstanding features already mentioned and you'll find a System offering everything you need for efficient, cost-effective operation.

Discover the advantages of our Universal Terminal System for yourself. For more information, call our system specialists toll free:

**Designers of innovative systems
for the information worker**

LEE DATA CORPORATION

7075 Flying Cloud Drive
Minneapolis, MN 55344
TWX 910-576-1690

800/328-3998



Provides Micro-Supermini Link

Plexus Unleashes Back-End Processor

SANTA CLARA, Calif. — Plexus Computers, Inc. has announced a back-end processor, the P/65, which allows users of Plexus and IBM microcomputers to access data stored in Plexus superminicomputers.

In addition, Plexus announced support for a relational data base management system (DBMS), Unify, developed by Unify Corp. The DBMS reportedly gives users access to data bases in multiple Plexus systems using the Unix operating system.

The P/65 acts as a network file server providing up to 1.1G bytes of storage, data base management and multiuser access to shared data. The unit was designed with disk caching hardware and software to store and retrieve shared data on a Xerox Corp. Ethernet local-area network. This, the vendor said, frees individual multiuser systems to perform terminal-oriented and DP functions.

Three Micros Share Memory

The P/65 consists of three microcomputers, which share from 1M to 4M bytes of memory. The Ethernet interface is accomplished via an intelligent network processor based on an Intel Corp. 8086 16-bit microprocessor with 128K bytes of main memory. This processor manages the network I/O transactions and handles low-level network protocol processing, the vendor said.

Disk caching software is executed by a mass storage processor, a 16-bit Zilog, Inc. Z8000 microprocessor with 128K bytes of memory. The mass storage processor reportedly anticipates those sections of the disk that are likely to be accessed and

stores that data in a buffer memory for retrieval, the vendor said.

All file-service functions are performed by a 32-bit Motorola, Inc. 68000-based file-service processor, which can be equipped with 1M to 4M bytes of main memory. This processor manages the Unix file system and directs the operations of the entire system.

The file-service processor also runs the Unify DBMS and other software packages, according to the vendor.

The P/65 supports up to four 285M-byte, 14-in. rigid Winchester disk drives with streaming 9-track tape backup. Smaller disk drives are also available, the vendor said.

The P/65 costs \$49,950 and operates with Unix System III and the firm's Network Operating System.

In addition to the P/65, Plexus unveiled a Unix network workstation capability, which permits stand-alone IBM Personal Computers to act as single-user, Unix-based microcomputers. The IBM Personal Computers can also serve as nodes on a Unix-based network with access to shared peripherals, data bases and larger Unix-based Plexus processors. The networking capability consists of a software package called Unetix. The package costs \$250, the vendor said.

The Unify DBMS permits multiple users in a Plexus network to gain access to data bases in various systems in the network. Unify is geared to larger data bases and transaction processing applications. Other features include a query function, report writer, host language interface and



The Plexus P/65, P/35 and P/25

transaction logging. Unify costs \$3,000, the vendor said.

Plexus is located at 2230 Martin Ave., Santa Clara, Calif. 95050.

North Star Offers Multiuser System, Fits IBM Micros

SAN LEANDRO, Calif. — North Star Computers, Inc. has announced the Dimension system, a multiuser microcomputer system that is compatible with IBM's Personal Computer and Personal Computer XT.

The Dimension system can support up to 12 users simultaneously with each user having the capability of running a different Personal Computer or Personal Computer XT application, the vendor said.

The heart of the system is an Intel Corp. 8086 microprocessor and a 13-slot IBM bus. Each user has a dedicated workstation board, which connects to the IBM bus. The Dimension system uses an operating system compatible with IBM's PC-DOS Release 2.0, the vendor said.

The microprocessor used in the workstation is an Intel 8088-2, which reportedly provides each user with the equivalent of a Personal Computer XT microcomputer.

In addition, the Dimension system offers each user access to common peripherals such as fixed disk drives, printers and communications devices, the vendor said.

Standard features of the Dimension system
(Continued on Page 137)

Western Graphtec Announces Line of X-Y Flatbed Plotters

IRVINE, Calif. — Western Graphtec, Inc., formerly Watanabe Instruments, has announced the WX 4630 series, a line of X-Y flatbed intelligent plotters.

Using one, two or 10 pens, the plotters are said to be directly compatible with digital control equipment through the use of standard interfaces, such as RS-232C, GPIB/IEEE-488 or 8-bit parallel.

The series features modular mechanical and electrical design, incorporating microprocessors and fully digitized inner controls. Other features include a pulse pen drive, 42 single-key programmable function commands, an operating speed of 16 in./sec., a 15-in. by 10-in. plotting area, a flatbed and a roll feed with or without a built-in paper cutter. Also, the plotters can

draw circles, curves and arcs, the vendor said.

The WX 4630 series ranges in price from \$3,990 to \$6,990. Western Graphtec is located at 12 Chrysler St., Irvine, Calif. 92714.



WX 4630 Intelligent Plotter

WE RENT TI PROFESSIONAL COMPUTERS

IN STOCK
TEXAS INSTRUMENTS PCs
CPU & KEYBOARD WITH
128K RAM MEMORY
TWO 320K DISK DRIVES
3 PLANE GRAPHICS
PRINTER PORT
COLOR MONITOR
MS DOS 2.0 & MS BASIC

AUTHORIZED
DEALER
TEXAS INSTRUMENTS
COMPUTER SYSTEMS



- Immediate Delivery
- Compatible Printers
- IBM & Kaypro Micros
- Data Communications
- Expertise Since 1966
- Offices Nationwide



DATA RENTALS/SALES, Inc.

Corporate Headquarters: 8611 Hayden Place, Culver City, CA 90230 (213) 559-3822

Atlanta
Charlotte
Chicago
Orange Co., CA
Philadelphia

(404) 951-0260
(704) 523-6885
(312) 593-2290
(714) 535-5501
(215) 839-9990

San Francisco
Tampa
New York/New Jersey
Outside California
Outside Florida

(415) 340-1515
(813) 934-0829
(800) 345-8026
(800) 421-4505
(800) 237-9863

**Believe it or not, you've
already prepared
your office for
OMNI even before
we invented it.**





**GTE introduces Omni.
The voice and data communications
system that hooks up to your existing
wiring. And will virtually never
become obsolete.**

It's that simple.

And that advanced.

You see, Omni is a totally digital communications system for both voice and data that can meet the needs of large and small concerns alike. For both today. And tomorrow.

It utilizes the existing twisted pair wiring scheme that eliminates the need for costly re-wiring every time you add, delete or modify features and functions in your system.

Omni is a high traffic switch with a dual bus architecture. Voice uses pulse code modulation. Data throughout is greatly expanded by using the proven packet-switching technology of GTE Telenet, and there's no effect on voice capacity.

Data is switched at 64 kbps synchronous and 19.2 kbps asynchronous. The packet-switching capability allows dissimilar terminals to communicate with each other; or with central computers. The Omni allows tandem switching of data circuits, use of various protocols and more efficient use of available bandwidth.

Omni represents GTE's ongoing commitment to providing businesses like yours with the most advanced communications you can find. A commitment backed by over a century of experience.

If Omni looks like the telecommunications system that's tailored for you, write us or call for more information on it at GTE Business Communication Systems Incorporated, P.O. Box 4050, 12502 Sunrise Valley Drive, Reston, VA 22091, 1-800-BCS-2900.

After all, you're halfway there already.

**We've simplified
a complicated business.**



**Business Communication
Systems**

Micro-Based Controller Supports DEC Systems

ANAHEIM, Calif. — Computer Storage Technology, Inc. (CST) has announced a microprocessor-based magnetic tape peripheral processor that supports Digital Equipment Corp. Unibus-based computers and can control up to four 9-track tape drives.

The firm also unveiled a streaming tape subsystem for DEC LSI-11 computers that provides up to 55M bytes of backup storage for Winchester disk systems.

The Model TC-200 controller is a single-board processor that can control tape drives operating at speeds ranging from 25 to 125 in./sec. It takes up one slot in the computer's backplane and can be used with 800 bit/in., 1,600 bit/in. and dual-densi-

ty tape systems, a spokesman claimed.

The unit features automatic self-test verification and read-after-write error-checking logic to prevent data

HP Announces 1/2-In. Tape Drive

PALO ALTO, Calif. — Hewlett-Packard Co. has announced the HP 7974A, a 1/2-in. tape drive designed for data backup on mid-range systems with between 100M and 500M bytes of on-line disk storage.

The HP 7974A can operate in either start/stop or streaming modes with a capacity of 1,600 phase-encoded char./in. The drive operates at 50 in./sec with a 200 in./sec backup speed when used in a start/stop

loss. It supports all DEC operating systems that include drivers for RSTS/E, RSX-11M and RT-11 operating systems. The unit can reportedly be installed without adding software

mode. Support for nonreturn to zero inverted (NRZI) 800 char./in. double-density tape formats is also available, the vendor said.

In a streaming mode, the tape drive can operate at 100 in./sec.

The HP 7974A is supported on the HP 3000, HP 1000 and HP 9000 series processors. The disk drive costs \$12,500. The NRZI format option costs \$2,500 from HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

drivers or implementing any diagnostic changes, the spokesman added.

The TC-200 costs \$3,000.

The CS-300 tape subsystem incorporates the firm's CC-300 single-board peripheral processor and a 1/4-in. streaming tape drive. The unit also includes a 1/4-in. tape cartridge as the high-capacity storage medium.

The device can be configured with two capacities: the 20M-byte CS-320 and the 45M-byte CS-345, which can be extended to 55M bytes by using an optional cartridge. Data transfer in both configurations can reportedly be sustained at 90K byte/sec with a 97% tape utilization.

The peripheral processor takes up one slot in the LSI-11 backplane, while the tape drive and associated power supply are contained in a single chassis that can be mounted in a standard 19-in. equipment rack.

The device costs \$4,970 from the firm at 1369 S. State College Blvd., Anaheim, Calif. 92806.

COMMUNICATION NETWORKS '84 offers you 100 solutions to your post-divestiture telecommunication problems.



Charles Wohlstetter
Chairman, CEO, Continental Telecom, Inc.
Keynote



F.S. Vigilante
AT&T Information Systems
Viewpoint



Mimi Dawson
F.C.C.
Policy



Howard Anderson
The Yankee Group
Futures



Amy D. Wohl
Advanced Office Concepts
Micro Networks

As telecommunications and data processing managers, your success depends on keeping up to date with changing technologies. At COMMUNICATION NETWORKS you can choose from 100 information-packed sessions designed to help you succeed.

You'll learn how to survive the transition into the competitive telecommunications environment resulting from the AT&T divestiture. You'll discover new applications in Local Networks, Satellite, Bypass/DTS, Public and Private Data Networks, Interconnection, Micro Networking and new management technologies.

COMMUNICATION NETWORKS gives you twelve sessions focusing on "Network Technologies." Thursday, February 2, is "Microcomputer Networking Day," a full day devoted to teaching you how to get more from your PC than just stand-alone applications.

You may even choose to develop specific skills in one of the nine full-day "In-Depth" seminars. "In-Depth" seminars will be held on January 30, one day prior to the official opening of COMMUNICATION NETWORKS.

In just five years, COMMUNICATION NETWORKS has become the leading professional communications conference and

exhibit in the nation. And COMMUNICATION NETWORKS '84 promises to be even better than ever—more sessions, more speakers, more exhibitors including American Satellite Co., AT&T Information Systems, COMSAT, Digital Equipment Corp., General DataComm Ind., General Electric Co., Integrated Communication Systems, General Electric Co., Microwave Link Operation, GTE Business Communications Systems, GTE Sprint Communications Corp., Harris Corp., DTS Div., Hewlett-Packard, M/A-COM, Mohawk Data Sciences, Northern Telecom, Inc., Scientific-Atlanta, Inc., Siercor Corp., 3M Business Communication Products, Ungermann-Bass, Inc., Uninet, United Technologies Communications Co. and many more offering the latest in products and services.

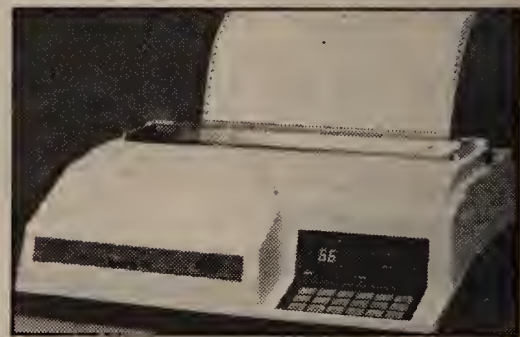
As an added plus for CN '84 attendees... you'll have a chance to win a DEC Rainbow 100+ Computer System.

COMMUNICATION NETWORKS '84, will take place at the Washington Convention Center in Washington, D.C., the telecomm capitol. It will be held on January 31 - February 2, 1984.

Call toll-free 800-225-4698 (In MA, 617-879-0700) for more information. Or fill out and return the coupon below.



The DEC Rainbow 100+ The Rainbow 100+ system unit features Z80A and 8088 microprocessors, a 10 MB Winchester hard disk, a dual floppy diskette with 800 KB capacity and sync/async communications, built-in terminal emulator, printer port and 128 KB of system memory.



ISI Model 487

ISI Model 487 Added to Line Of Printers

ANN ARBOR, Mich. — Interface Systems, Inc. has announced the ISI Model 487, the latest addition to its family of IBM 3270 plug-compatible printers.

The printer is said to incorporate a variety of features into a tabletop design. The Model 487 reportedly delivers near-letter quality or 7- by 9-in. dot matrix printing. It accepts continuous forms and offers a demand document feature. Single-cut letterhead sheets can be fed manually or automatically with the optional sheet and envelope feeder. A control panel provides access to the ISI 487's programmable memory, the vendor said.

The ISI Model 487 comes ready to be plugged into any IBM 3274/3276 system and offers standard coaxial support of IBM's Synchronous Data Link Control Character Strength.

The Model 487 costs \$3,950, according to the vendor. ISI is located at 5855 Interface Drive, Ann Arbor, Mich. 48103.



COMMUNICATION NETWORKS
Conference & Exposition

Washington, D.C. • January 31–February 2, 1984

The Sixth Annual Communication Networks Conference & Exposition for the Telecommunications Business Professional

Washington Convention Center, Washington, D.C.

Save \$50.00!

Register for COMMUNICATION NETWORKS by December 16 and get the full 100-session conference program for only \$395.00!

Call 1-800-225-4698 to register. Or fill out this coupon and return it. We'll be glad to bill you or your company.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

LOTUS 1-2-3™

Lotus 1 2 3 and Dataproducts P Series color printer are the best combination for any business assignment.

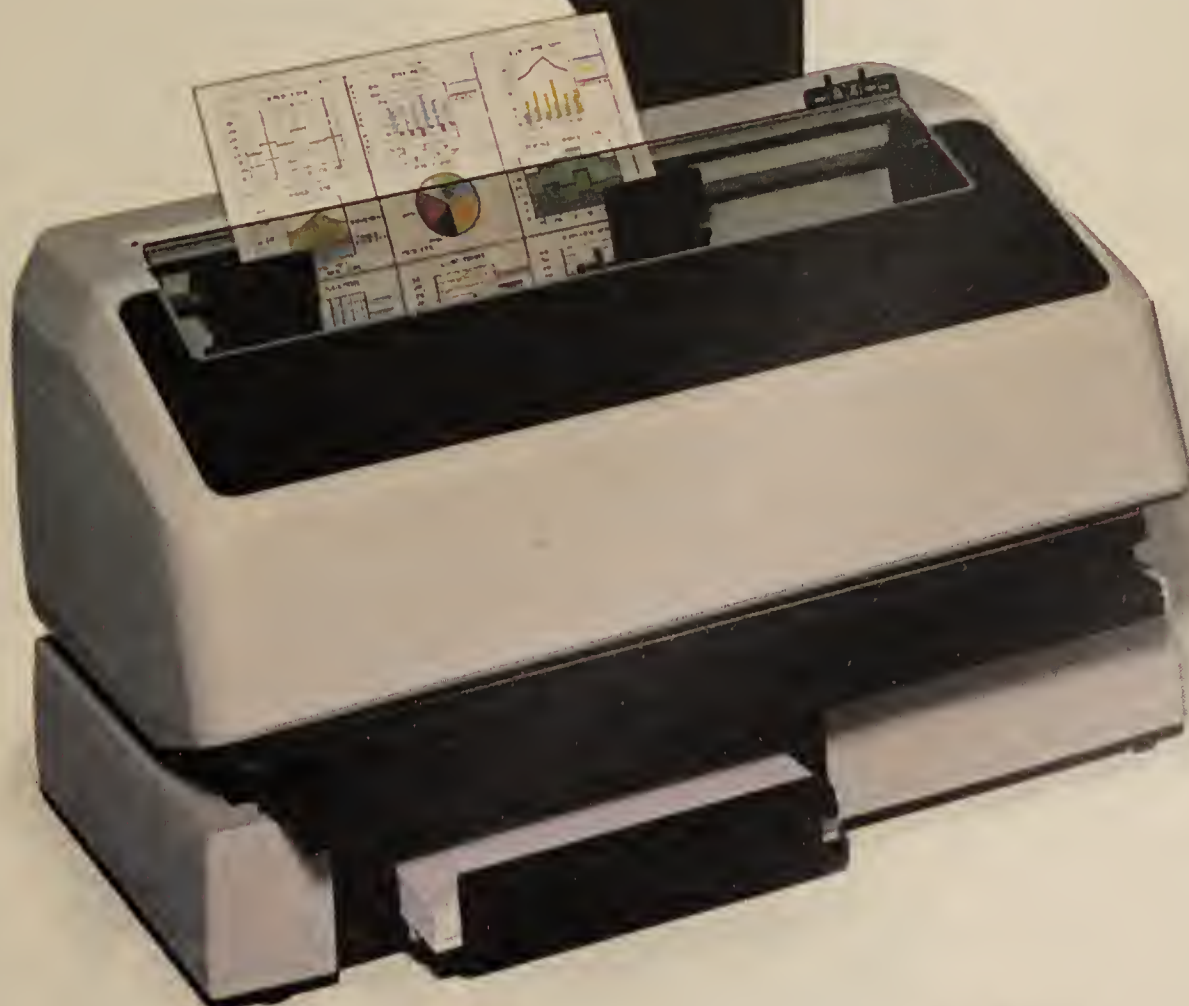
Everyone's talking about the best software package on the market, the Lotus 1 2 3. Dataproducts wants you to go one step further with their P Series color printer.

The versatile P Series translates the wealth of information generated by the Lotus 1 2 3 into brilliant full color charts, graphs and text.

It delivers a full page of text quality print in nothing flat while its sheet feeder automatically prevents loading hassles. And the P Series uses pin feed or plain paper and has the brains to fill every

appropriate line with crisp, sharp copy, even if it has to justify to do it. And the P Series color printer has dual speed capability for correspondence quality output for word processing applications, and high speed output for draft or spreadsheets.

The Dataproducts P Series color printer. And the Lotus 1 2 3. There's no better combination on the market. For more information go 1234 to your nearest computer store and ask about our P Series color printer, or call Dataproducts, 1-800-258-1386.



DATAPRODUCTS
The Printer Company



COMDEX/Fall '83 SEE US AT BOOTH #3086

1-2-3 and Lotus are trademarks of Lotus Development Corporation.

SMS Micro/TSX-Plus Software-Compatible With DEC PDP-11

NASHVILLE, Tenn. — A multiuser microcomputer system that is software-compatible with Digital Equipment Corp.'s PDP-11 mini-computer has been announced by Scientific Micro Systems, Inc. (SMS).

Called the SMS Micro/TSX-Plus (the computer runs under the firm's TSX-Plus operating system), the machine is built around DEC's LSI-11/23 CPU and can accommodate from three to 16 users. The system includes 15.9M bytes of hard disk storage and can be placed on a desktop, a spokesman said.

The unit includes a memory management facility that is said to speed throughput by allowing many processes to reside simultaneously in up to 4M bytes of main memory. It also has a transparent spooling system that allows users to print files without degrading terminal and program performance.

Other features of the TSX-Plus operating system include system administrative control, shared-file record locking, data and directory caching, program debugging facilities, performance analysis and a system optimization utility.

The system is preconfigured to support three user-supplied DEC VT100 terminals and one serial port operating at 9,600 bit/sec. It can be expanded by upgrading to the firm's full implementation of the operating system, adding four serial ports and 256K-byte memory modules.

Repair Aid Designed For Unibus

HOUSTON — Information Products Systems, Inc. has announced its Digital Equipment Corp. VAX-11 Unibus maintenance aid said to allow troubleshooting and repair of all Unibus peripherals without interrupting VMS operation.

The Model 700 is plugged into the Unibus path and reportedly allows the user to switch the Unibus string on and off. The switching operation does not generate unsolicited interrupts to the VMS operating system causing errors.

A 14-day free evaluation is offered to credit-approved customers. The Model 700 costs \$995 from Information Products Systems, 6567 Rookin, Houston, Texas 77074.

The largest TSX-Plus system will support up to 30 concurrent tasks as well as real-time jobs, the firm said.

The SMS Micro/TSX-Plus costs \$11,000 from Scientific Micro Systems at 1027 17th Ave. S., Nashville, Tenn. 37212.

Hard Disk Subsystem Fits IBM Micro

SANTA ANA, Calif. — A 5¼-in. hard disk subsystem for the IBM Personal Computer has been announced by Zetec Corp. The unit integrates a number of popular business and word processing software packages along with a data storage area.

Called the Business Manager subsystem, the hardware/software device boasts from 10M to 15M

bytes of storage and integrates such software as Micropro International Corp.'s Wordstar, Spellstar and Mailmerge and Datamension Corp.'s Report Manager spreadsheet program and Exec program generator. A relational data base manager and six accounting programs are also included, the vendor said.

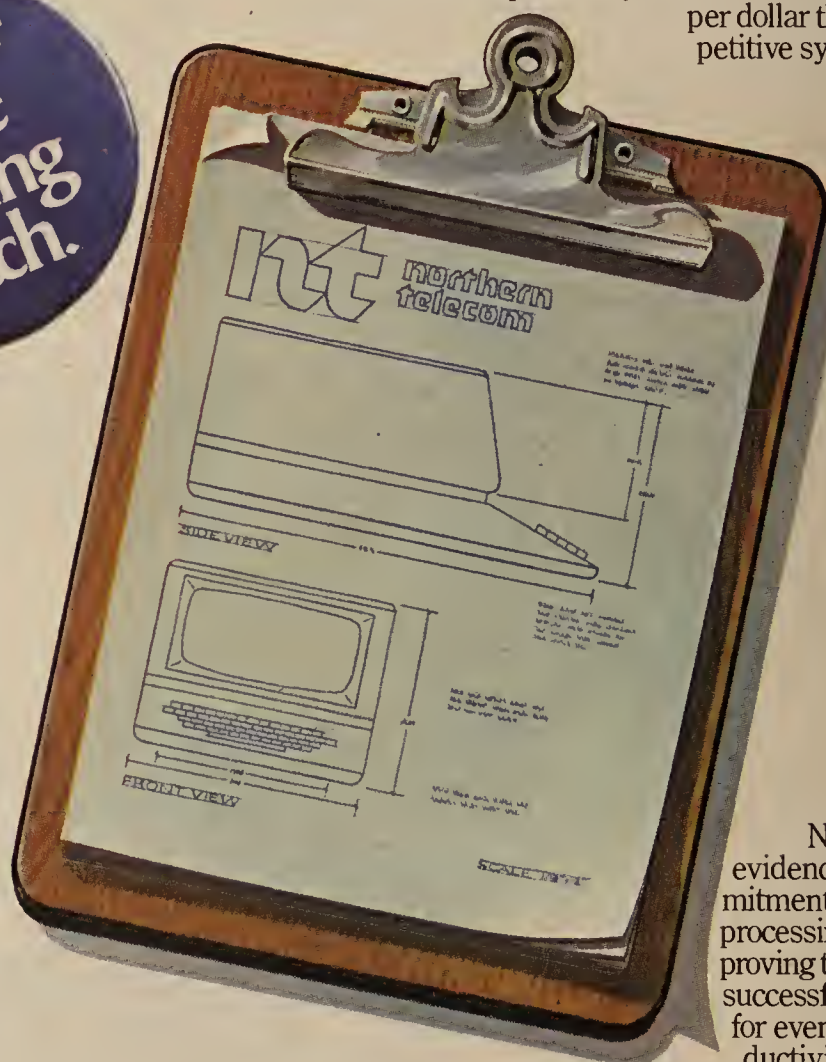
All of the software pro-

grams are integrated into a single shell section on the hard disk and can interact with data stored on the main portion of the disk as well as with each other, a spokesman said.

The system costs \$4,500 for the 10M-byte version and \$5,200 for the 15M-byte disk unit.

Zetec is located at Suite 115, 1420 E. Edinger Ave., Santa Ana, Calif. 92705.

**The Northern Telecom system:
A benchmark in batch processing
that keeps getting better.**



Northern Telecom batch processing systems have proven themselves, in more than a decade of use in a variety of applications, to be among the most reliable, practical, cost-effective systems ever developed. They deliver more throughput per dollar than any competitive system.

Now, as solid evidence of our commitment to batch processing, we're improving these already-successful systems for even more productivity. For

instance, we're introducing a new high-speed band printer with changeable type. Operating now with IBM's SNA, we've also added new, low-cost distributed data processing capabilities for more system versatility, and to provide for future growth toward the integrated office.

We're back



UCS' Tapesaver 969 Cartridge Tape System

Cartridge Tape System Targets Users of IBM Series/1 Minis

DENVILLE, N.J. — A cartridge tape system that allows users of IBM Series/1 minicomputers to store and retrieve data on ¼-in. magnetic tape cartridges was recently announced by Ultimate Computer Services, Inc. (UCS).

The UCS 969 cartridge tape system, named Tapesaver, is available in two

models operating at storage rates of 30 in./sec or 17,500 byte/sec for the Tapesaver/1, and 60 in./sec or 35,000 byte/sec for the Tapesaver/2. Retrieval rates are 60 in./sec and 90 in./sec, according to a company spokesman.

The Tapesaver/1 will copy 67M bytes of data on one 600-ft cartridge in one hour, and the Tapesaver/2 will

copy the same amount of data in half the time, the company said.

Each system consists of a cartridge tape drive, controller, power supply and a single-board attachment card that fits into one I/O slot on any Series/1. The units mount into the IBM 4997 rack enclosure.

Each model costs about \$7,000 from UCS, 30 Broad St., Denville, N.J. 07834.

Andromeda Introduces Micro

CANOGA PARK, Calif. — Andromeda Systems, Inc. has announced a transportable computer system based on Digital Equipment Corp.'s LSI-11 processor and Q-bus.

Called the 11/M12, the unit features an LSI-11/23 processor, 256K bytes of random-access memory, 10M bytes of fixed Winchester disk storage, 512K bytes of floppy disk storage and four serial ports.

The unit runs standard DEC software including the RT-11, TSX-Plus and RSX-11M operating systems, the vendor said.

When used with a standard CRT terminal, the unit can be used as an intelligent workstation.

The 11/M12 costs \$8,400 from Andromeda Systems, 9000 Eton Ave., Canoga Park, Calif. 91304.

ADC Unit Translates Disk Media

TUSTIN, Calif. — Applied Data Communications, Inc. (ADC) has announced a universal diskette reader/writer. The unit is said to be a media translation system that accepts source computer data from a floppy disk of any size, density and format.

The Model TM-500 reportedly resolves physical and logical incompatibilities among floppy disk formats enabling computers to interchange Digital Research, Inc. CP/M files, text and data bases.

A standard X-on/X-off feature reportedly allows the TM-500 to accept real-time data communications input.

IBM's Binary Synchronous Communications protocol is optional at \$1,600. In its basic configuration, the TM-500 system is priced at \$15,800 from ADC, 14272 Chambers Road, Tustin, Calif. 92680.

Your processing may be remote, but Northern Telecom service is on the spot.

With service and maintenance professionals located at 157 cities nationwide, we're able to provide prompt response to your call for service. How fast? Two hours in major metropolitan areas; four hours in most other areas of the country. And our multi-year maintenance agreements guarantee continuing, low-cost operation of your Northern Telecom system.

If your system lease expires within the next six months, now is the time to find out more about batch processing from Northern Telecom.



Call our toll-free number: 800-331-3113. Or write Northern Telecom, Mail Station T-240, P.O. Box 1222, Minneapolis, Minnesota 55440. We'll show you how we can tailor a batch system to your specific needs. And save you money, too.

nt northern
telecom

ing batch!



**THE
PRIME 9950
IS POWER
AND
PERFORMANCE.**

THE NEWEST EXAMPLE OF PRIME'S COMMITMENT TO TECHNOLOGICAL LEADERSHIP.

When we introduced the world's first virtual memory, 32-bit supermini we set the pace for leadership that still drives our business today.

For proof we offer the Prime 9950 – the most powerful, most technologically advanced computer we've ever designed.

It uses high speed Emitter Coupled Logic – a rarity in minicomputers. Advanced pipeline architecture and unique branch cache memory allow five instructions to be processed in parallel and 255 user processes to be handled at once. 2MB memory boards allow you to economically configure systems up to 16MB. These technical advances provide the power, throughput and price/performance of the Prime 9950.

Like all Prime 50 Series systems, the Prime 9950 runs with PRIMOS, the operating system that makes it possible to easily and economically move software among all Prime systems, or upgrade your system without costly reprogramming or recompiling.

Add the Reliability, Availability and Serviceability built into the Prime 9950 with its new diagnostic processor, and the result is a distinctive combination of a highly affordable, high performance computer, backed by the service and support you expect from a Fortune 500 company.

The Prime 9950. It's our latest and greatest technological achievement. And there's nothing else like it. Anywhere.

For more on the Prime 9950, or on the entire Prime family of compatible computers, call **1-800-343-2540** (Mass., 1-800-322-2450), or write Prime Computer, Prime Park, MS 15-60, Natick, MA 01760. In Canada call 416-678-7331. In Europe write, One Lampton Road, Hounslow Center, Hounslow, Middlesex, TW3 1JB, England. In the Far East, write Unit 1005, Tannery Block, 35 Tannery Road, Singapore 1334.

PRIME
Computer
Offices worldwide.

System Provides Services To Micros Under CP/M

FAIRFIELD, N.J. — Personal Computer Gateway, Inc. recently announced a hardware and software system that provides communications capability, file handling and storage service to microcomputers operating under Digital Research, Inc.'s CP/M operating system.

Called the Data Pouch, the unit includes an 80M-byte hard disk drive, eight I/O ports and software.

The product connects to several popular microcomputers through RS-232 ports. The Data Pouch provides file storage and file transfer among connected microcomputers as well as electronic mail, a bulletin board and private and shared user

files. Other features include security sign-on and menu commands.

The product reportedly provides facilities for registering up to 31 users. It will support a mix of eight to 16 simultaneous users depending on the transmission rate. The product supports transmission speeds up to 9,600 bit/sec over dedicated lines and up to 1,200 bit/sec over direct-dial lines. It is available for IBM Personal Computers and compatible products; Apple Computer, Inc.'s Apple II and III; and other micros operating under CP/M.

The package costs about \$19,000 from Personal Computer Gateway, 22 Daniel Road, Fairfield, N.J. 07006.

Sony Bundles SMC-70 Models

PARK RIDGE, N.J. — Sony Corp.'s Information Products Division has announced the availability of four bundled versions of its SMC-70 microcomputer system. Each one includes Digital Research, Inc.'s CP/M operating system and a variety of vertically targeted software programs.

At the same time, Sony announced price reductions in the components that make up the SMC-70 microcomputer.

The bundled systems, each equipped with dual 280K-byte, 3½-in. floppy disk drives, include:

- The Generalist, consisting of a 12-in. Sony monitor, dot matrix printer, word processing and spreadsheet software and all cables and wiring. It costs \$3,451.

- The Artist's Easel, including a 12-in. color monitor, Sony Disk Basic and Graphics Editor software, costs \$2,691.

- The Manager includes a color monitor, spreadsheet software and Sony's Record Management package for small businesses or department-level managers. This is an expandable system for business modeling applications and costs \$3,036.

- The Bookkeeper consists of the color monitor; dot matrix printer; 6M-byte Corvus Systems, Inc. hard disk system with interface; and accounts payable, receivable and general ledger software. This system, priced at \$6,700, was designed to handle large amounts of data.

Peripherals for each of the systems include a 5¼-in. hard disk system and 256K bytes of cache memory. Each system includes 13 resident I/O interfaces as standard equipment, including a Centronics Data Computer Corp.-type parallel port, an RS-232C serial interface and a red-green-blue video port. The basic units also have a battery backup clock/calendar, system test diagnostics and a time generator, a spokesman said.

Price reductions on SMC-70 components include markdowns on some peripherals, including the 64K-byte keyboard/CPU console, which will be discounted by \$480, Sony announced.

Sony is headquartered at Sony Drive, Park Ridge, N.J. 07656.

CAD System Out, Based On DG Series

FAIRFIELD, Conn. — Summagraphics Corp. has introduced Icon, a computer-aided design (CAD) system based on Data General Corp.'s new Desktop Generation series computer.

The CAD system was designed for applications in the architectural, engineering, construction and printed-circuit board marketplaces.

Icon features full performance capabilities and all software necessary to create, preview, edit, store and recall graphics in a professional workstation.

It offers a self-contained, ergonomically designed workstation available in single- and dual-user configurations. Each workstation has an integral digitizer with an easy-to-use menu and two tilt and swivel monitors, a spokesman said.

The new system features a 19-in. raster graphics display with instructions and built-in Help tables detailing the steps required for any operation.

Complete application packages for AEC and PCB professionals are available. The packages include programs for architecture, civil engineering, surveying, cost estimating, printed-circuit design, mechanical and electrical design and word processing.

A per-workstation price of \$37,250 is based on a four-workstation configuration.

More information is available from Summagraphics through 35 Brentwood Ave., P.O. Box 781, Fairfield, Conn. 06430.

FOR THREE DAYS IN FEBRUARY, ALL EYES IN TEXAS WILL TURN TO THE IBM PC.



**THE TOTAL SHOW FOR BUYERS AND SELLERS OF IBM PC PRODUCTS.
FEBRUARY 1-3, 1984 • ASTRO HALL, HOUSTON, TEXAS.**

The IBM Personal Computer. It's changing the face of computing. And these three days in Houston could change the way you look at the PC. You'll meet scores of the world's leading producers of compatibles, peripherals, software and services. Hear recognized experts on how the IBM PC can go to work for you. It's the biggest event in Texas for the most important computer in history.

FOR EXHIBITOR INFORMATION CALL 1-617-329-7466 OR 1-617-329-8091.

Produced by Mitch Hall Associates in cooperation with CW Communications, Inc., the world's leading publisher of computer related newspapers and magazines, including PC World, ISO World, InfoWorld and Computerworld. IBM is a registered trademark of the International Business Machine Corporation. PC World Exposition is a trademark of Mitch Hall Associates. All rights reserved.

A computer upgrade with Wang won't stunt your company's growth.

The best reason for choosing a Wang VS computer today may be tomorrow. Because unlike comparable IBM systems, the Wang VS line is a computer family with a smooth, proven and continuous growth path.

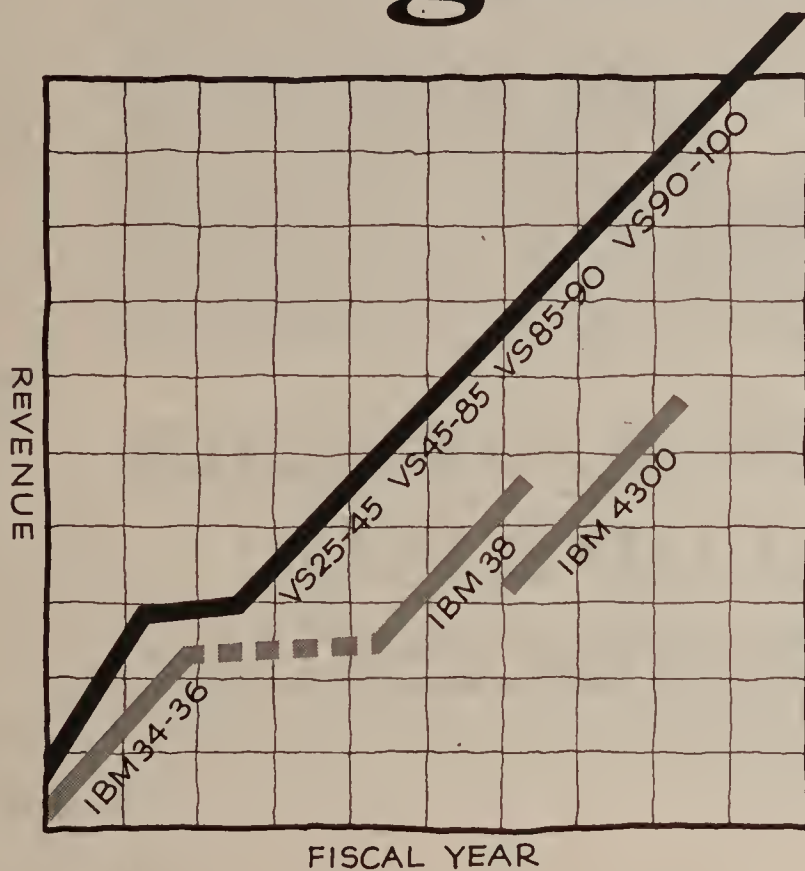
Consider. All Wang VS computers use a single operating system and single system software. Once your people are familiar with one Wang VS, they're already familiar with the next.

On the other hand, the IBM 34/36, 38 and 4300 all use different operating systems, different source codes and even different software. Upgrading from one to another is almost like starting over again with a whole new system.

A typical conversion from the IBM 34/36 to a Wang VS computer takes about two months. From then on, no other conversions are necessary.

Converting from the IBM 34/36 to the IBM 38 is a long and tedious process. And you face an even more difficult task going to an IBM 4300. That's time and money that a growing company just can't afford.

If you want to spend more time doing business, and less time getting ready to do business, choose the Wang VS computer line. It won't stunt your company's growth no matter how fast you grow.



For a demonstration of Wang VS computers, call 1-800-225-9264. Or send this coupon to: Wang Laboratories, Inc., Business Executive Center, One Industrial Avenue, Lowell, MA 01851.

Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____
 () _____
 Telephone _____

CW11

WANG

The Office Automation
Computer People.

Hard Disk Drive Line Also Announced

Disk Cache System Targets IBM Micro Users

SAN JOSE, Calif. — Santa Clara Systems, Inc. (SCS) has introduced a disk cache system and a line of internal hard disk drives for IBM Personal Computer users. In addition, SCS is offering upgrades of its high-capacity, external 5¼-in. hard disk drives.

Quick Disk, the disk cache system, is said to be an exter-

nal add-on memory device that contains random-access memory ranging from 128K bytes to 1M byte and dynamic error correction.

Attached to an IBM Personal Computer, the product is said to increase the speed and performance of SCS' PCnet network and to speed up hard disk drives. The five models of Quick Disk range

in price from \$2,795 for 128K bytes to \$8,595 for 1M byte, the vendor said.

The newly announced family of internal disk drives was designed for use with the IBM Personal Computer or Personal Computer XT. Offered in three configurations and in kit form, the 3.9-in. drives fit into one of the Personal Computer's floppy

disk enclosures. The line of products ranges in price from \$2,095 to \$2,995, the vendor said.

The upgraded 5¼-in. hard disk drives reportedly give users 20% more storage capacity and about a 25% increase in I/O throughput for the same price. The upgraded versions feature 6M, 12M or 18M bytes of fixed disk

storage, with 6M bytes of storage on a removable 3.9-in. cartridge.

The prices range from \$2,295 to \$5,056 from SCS, 1860 Hartog Drive, San Jose, Calif. 95131.

Sanyo Micro Competes With IBM

MOONACHIE, N.J. — Sanyo Business Systems Corp. has unveiled the MBC 550 series, a 16-bit microcomputer that reportedly will run about 80% of the off-the-shelf programs for the IBM Personal Computer. The system differs from the Personal Computer in that it does not address memory in the same location and offers eight colors to IBM's four, a spokesman said.

The MBC 550 series includes a detachable keyboard and 128K bytes of random-access memory that is expandable to 256K bytes. In addition, the unit features a standard parallel printer port, optional serial port, dual disk drive, speaker and joystick ports, the spokesman said.

The MBC 550 comes with Information Unlimited Software, Inc.'s Easywriter I, Micropro International Corp.'s Wordstar and Calstar, Sanyo's Basic and Microsoft, Inc.'s MS-DOS.

It costs \$999. Sanyo is located at 51 Joseph St., Moonachie, N.J. 07074.

Omni Line Beefed Up

SAN DIEGO — Digital Computer Corp. has added two models to its Omni line of multiuser microcomputers.

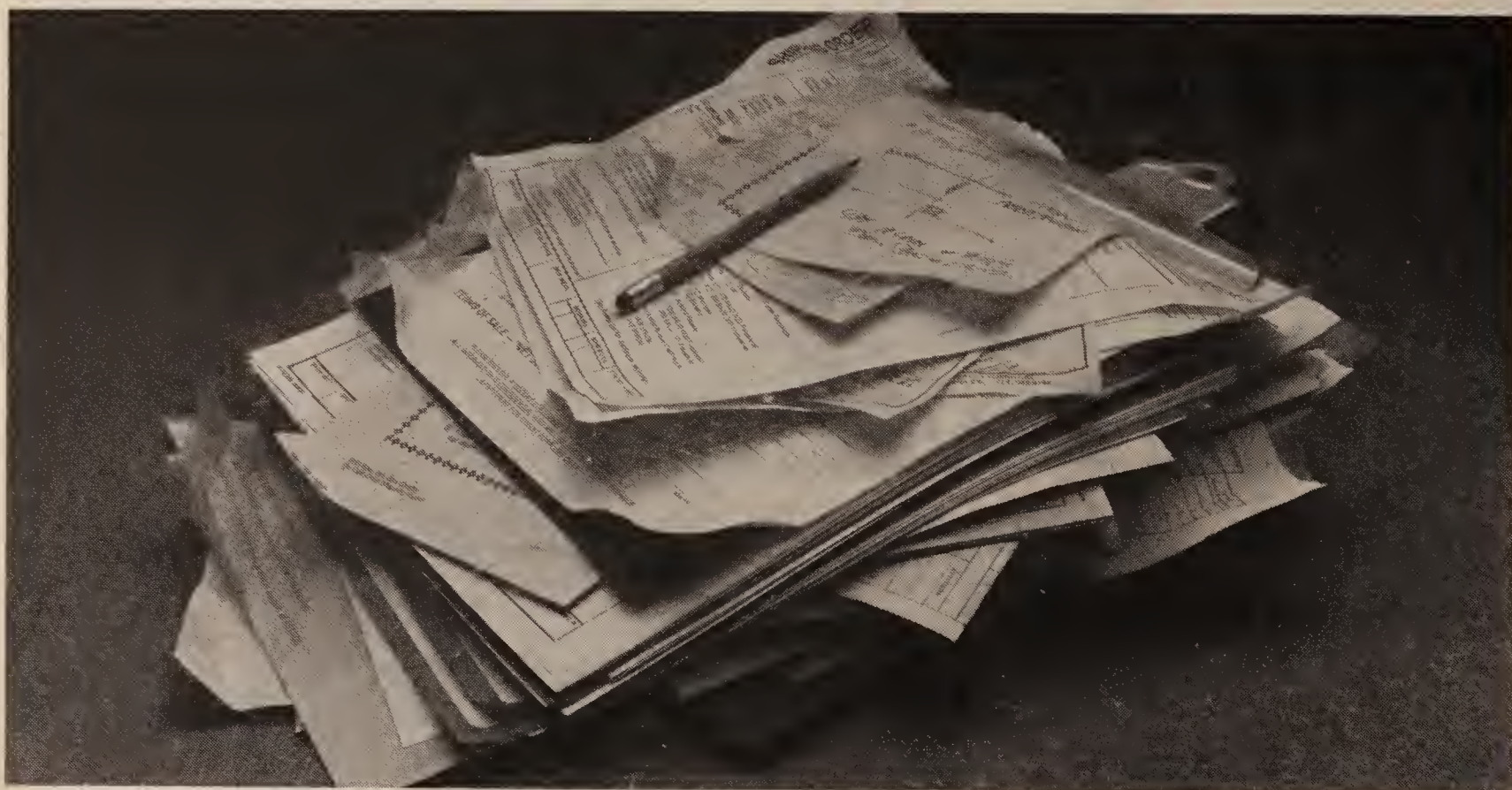
Called the Series 2000 and 4000, the models use Digital Research, Inc.'s CP/M or Software 2000, Inc.'s Turbo DOS operating systems. The Series 2000 has single or dual hard disk configurations and offers up to 106M bytes of disk storage.

Up to 10 users can operate the Series 2000, according to the vendor.

The Series 4000 can operate with two or four hard disk drives, offering up to 212M bytes of storage. The Series 4000 supports up to 32 users.

The Series 2000 costs from \$6,595. The Series 4000 costs from \$17,995.

Digital Computer is located at 7430 Trade St., San Diego, Calif. 92121.



It's time the technology of data collection caught up to the technology of data processing.

The speed of your data processing is limited by the speed of your data collection and input. Unfortunately, for a lot of people, data collection technology stopped with the development of the clipboard.

But MSI has changed all that.

Because MSI portable data collection systems are microprocessor-based answers to multipart forms. They actually extend the power of your central computer by allowing data to be keyed in right in the field. And then transmitted over ordinary phone lines to a host computer or data processing center.

MSI systems eliminate paper shuffling, keypunching, and errors by collecting data at its source. At

the same time, we return control to the data processing department, eliminate costly time delays, and match the sophistication of your central system with our equally sophisticated remote system.

Our family of hand-held terminals can be used anywhere there's data to be collected. For salesman order entry, inventory control, financial reporting, manufacturing control, and field data collection tasks of all kinds.

Learn how MSI data collection products can bring your system to the peak of its capabilities. Just return the coupon.

You'll find the technology of data collection is right where you want it.

MSI Data Corporation
340 Fischer Avenue
Costa Mesa, CA 92626

I am interested in:
☐ A sales presentation
☐ Product literature

Name/Title _____

Company _____

Address _____

City _____

State _____

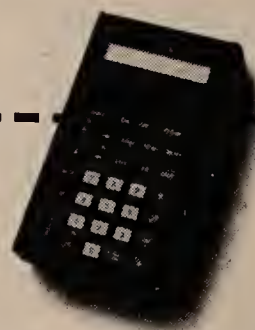
Zip _____

Telephone _____


Computer _____

MSI
DATA CORPORATION

The world leader in portable data collection systems.



The first software that's truly compatible with the ultimate personal computer.



Every software ad you read seems to be talking about 'integrated software.' But it was 1-2-3™ from Lotus® that actually gave the phrase real meaning, because we combined spreadsheet, information management and graphic functions in one simple, powerful program.

A program that is faster and easier to use than any other software available today.

In short, the tasks it can perform are really impressive, but why it can perform them is even more important.

Because we feel the real criterion for any management tool is its ability to let the human mind flourish

and accomplish more than it ever has before.

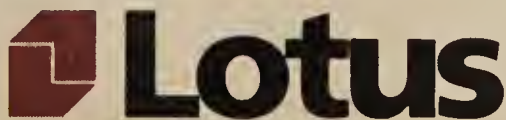
That's why with 1-2-3 the thought process is not interrupted, so your mind no longer has to wait for your hands. To the novice, it makes everything plausible. To the expert, it makes anything possible.

The results: Business decisions come faster and easier.

1-2-3 from Lotus is truly compatible with the most important personal computer of all—the human mind.

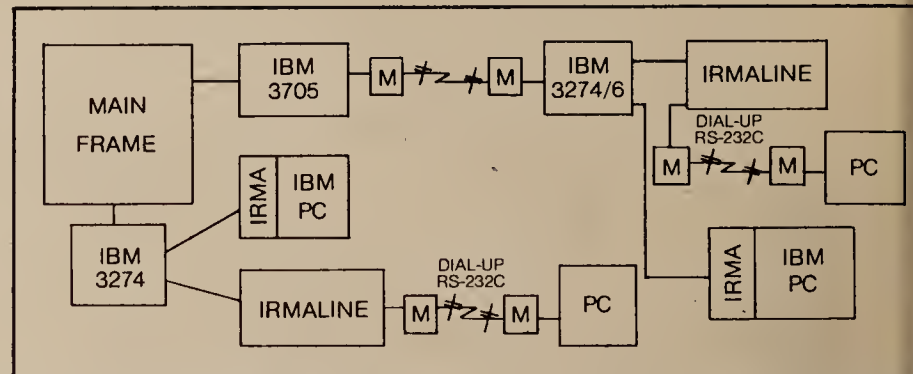
And isn't that what integration really should mean?

Call 1-800-343-5414 (In Massachusetts call 617-492-7870) and find out more about 1-2-3 from Lotus.



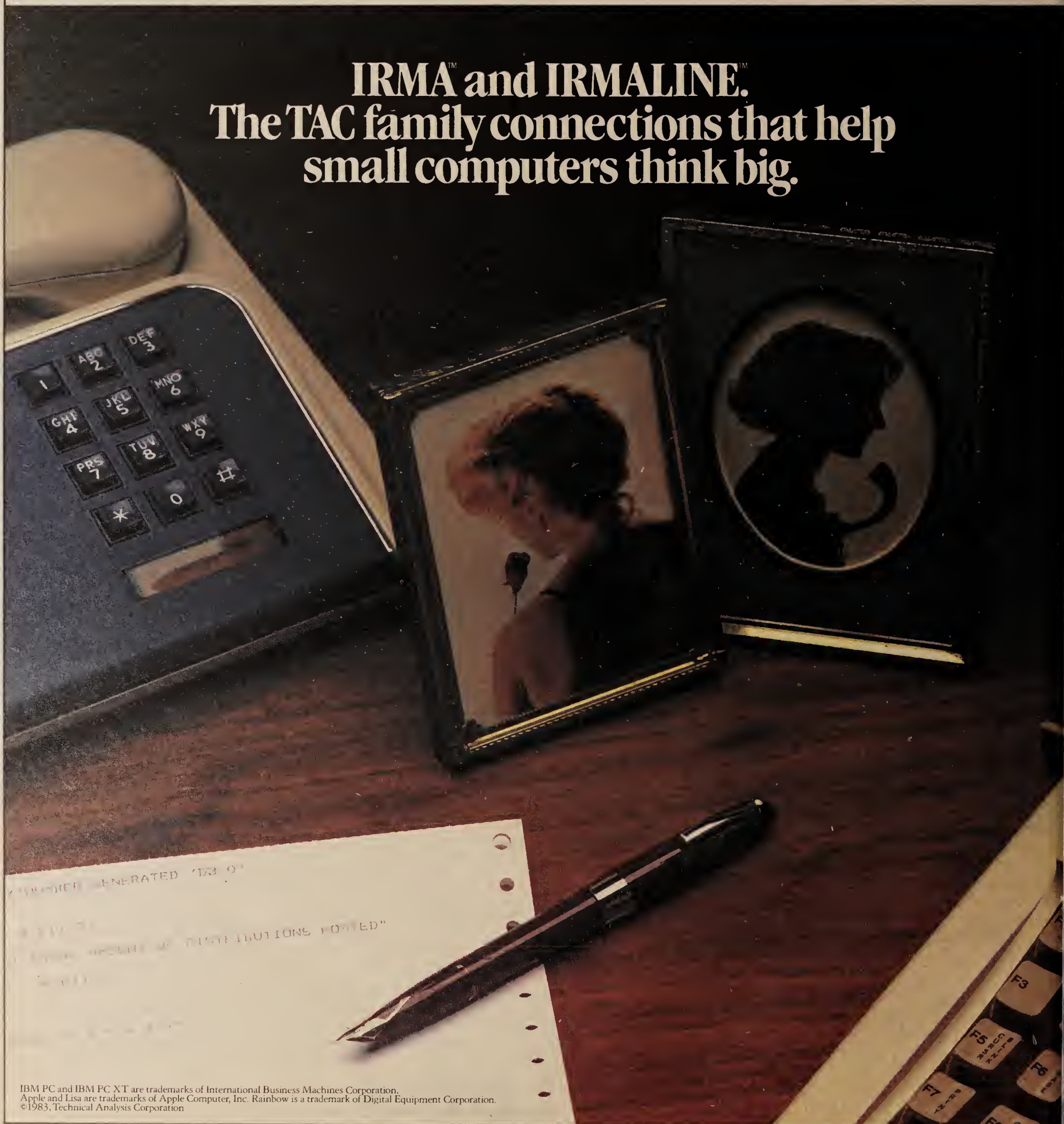
The hardest working software in the world.

Here are two beautiful ways to get small computers on line with the mainframe quickly, easily and economically — yours from TAC, home of the industry's first coaxial cable links between small computers and IBM 3270 networks.



IRMA™ is the Decision Support Interface™ that gets IBM Personal Computers and IBM PC XT's into the 3270 mainstream via direct attachment to 3274 or 3276 controllers.

IRMA™ and IRMALINE™ The TAC family connections that help small computers think big.



IRMALINE™ does the same for remote IBM PCs, IBM PC XTs, Apple Lisas and DEC Rainbows, among others, with just a local phone call to a nearby 3270 controller.

Both can go to work literally minutes out of the box. Both provide mainframe data access, selection and storage, and data communication back to the mainframe.

Put first things first. Find out more about the TAC first family of 3270 micro/mainframe connections. For information, write TAC, 120 W. Wieuca Rd., N.E., Atlanta, Georgia 30042. Phone: (404) 252-1045, TELEX 54-9600. Or call us toll-free (800) 241-IRMA. **Getting computers down to business.**



Having several different micros within the same company can mean having several major software problems, too. Because you have to purchase or develop different software versions for each micro. And let's face it, constantly rewriting your programs, or having to buy new ones, soon strains any budget.

Well, thanks to the p-System from SofTech Microsystems, there's a way to run the same software on virtually all of your company's micros.

The p-System is like nothing you've ever seen before. Because it's more than just "portable" software. It's the world's only Universal Operating System.™

With the p-System, a program you buy or develop for one brand of micro can also run on an IBM, Apple, TI, Corvus, Epson, Tandy, HP, Wang, Digital, NCR, NEC and over 100 other micros.

Because the p-System was specifically designed to help resolve the differences between micros.

Using the p-System, you can also develop your own software programs in UCSD Pascal®, FORTRAN-77, BASIC, and assembly language.

What's more, there are hundreds of p-System applications already available. Including professional productivity tools, accounting packages, spreadsheets, wordprocessing, database management, and graphics.

So save yourself time, money and countless reprogramming, maintenance and support headaches. Call or write SofTech Microsystems today.

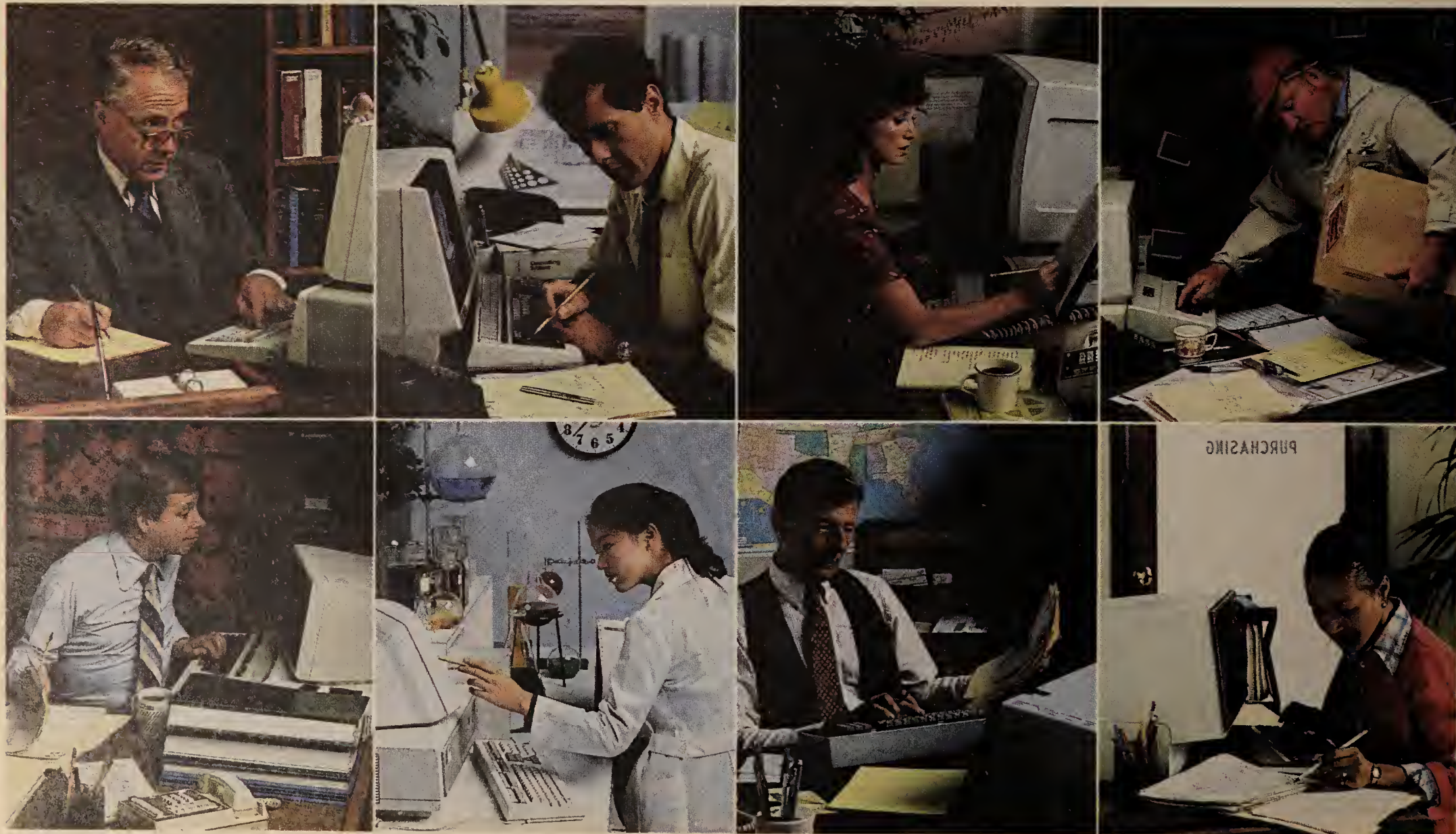
We'll show you why the p-System has such universal appeal.

SofTech Microsystems, Inc.
16885 West Bernardo Drive
San Diego, CA 92127
(619) 451-1230

SOFTech
MICROSYSTEMS

p-System and Universal Operating System are trademarks of SofTech Microsystems, Inc.
UCSD Pascal is a registered trademark of the Regents of the University of California.

The p-System.™ Resolving the differences between computers.



Sunol's Mass Storage System Boosted With 5¼-In. Disk

PLEASANTON, Calif. — Sunol System Co. has upgraded its microcomputer Mass Storage System with a 5¼-in., 51M-byte Winchester disk drive system.

Host adapters are available for IBM; Texas Instruments, Inc.; Apple Computer, Inc.; Radio Shack; and other microcomputers.

The half-size Winchester features built-in error-correction code, run length limited magnetic tape-coding format and a proprietary controller design. Those features reportedly enable Sunol Systems to provide up to 60% more usable storage and allow informa-

tion transfer rates to climb from 5M bit/sec to 7.5M bit/sec. Users reportedly can double their storage by using two of these half-size drives in place of a 5¼-in. drive.

Up to 64 users and up to seven different operating systems can share a single Mass Storage Unit.

The Mass Storage Disk costs \$4,595 and will be available in December. On-line backup storage (32M-byte capacity) is available via a ¼-in. tape cartridge that lists for \$1,295 from Sunol Systems through P.O. Box 1777, 1072 Serpentine Lane, Pleasanton, Calif. 94566.

Disk Controller Designed To Optimize Unix Systems

DALLAS — A hard disk controller said to be designed to optimize the Unix operating system and Unix-based systems was recently announced by Interphase Corp.

The company's SMD 2190 features cache memory and an intelligent caching system whereby the controller predicts what data will be accessed next and caches it in the controller memory for immediate availability to the operating system, a spokesman said. A selected override capability allows reading on a non-cached basis.

The unit reportedly formats disks in programmable groups of contiguous sectors. It also features a direct

mode that bypasses the controller's on-board buffering and provides direct connection between the bus and the disk, the spokesman said.

The SMD 2190 supports many popular microcomputers and disk drives, the company said. Single-unit purchase price is \$2,250. Additional information is available from Interphase, 2925 Merrell Road, Dallas, Texas 75229.

Kaypro Micros Receive Adapter, Cable

ORANGE, Calif. — Advent Products, Inc. has announced an External Monitor Adapter (EMA) and a 12-ft keyboard cable for Kaypro, Inc.'s Kaypro II and 4 microcomputers.

The EMA reportedly provides the ability for the Kaypro II or 4 to drive an external video monitor. Installation does not alter or damage the motherboard, and no soldering, desoldering or wiring is required. It costs \$59.95, the vendor said.

Using the same type and quality of cable, the 12-ft keyboard cable is said to be a direct replacement for the original 6-ft cable and works with the Kaypro II, 4 or 10. It costs \$12.95. Advent Products is located at 965 N. Main St., Orange, Calif. 92667.

Comrex Christens Multicolor Plotter

TORRANCE, Calif. — Comrex International, Inc. has introduced a plotter for users of the IBM Personal Computer, Epson America, Inc. QX-10, Apple Computer, Inc. computers and other microcomputers.

The Model CR-1810 Comscribe I plotter can produce charts, graphs and illustrations in several colors. The plotter uses paper 8½-in. wide by 1-in. to 10-ft long. The basic plotting area of 8½-in. by 11-in. can be extended up to 120 in. in length. Characters ranging in height from an ⅛-in. to 20-in. high can be drawn. The plotter measures 2.9-in. by 14.3-

in. by 8.8-in., the vendor said.

Using a pen, the plotter reportedly can operate at up to 6 in./sec, and line segments are accurate to one four-thousandth of an inch.

Drives Target Honeywell DPS 6

CHICAGO — Knaus Systems, Inc. has announced its Parrot Winchester disk drives that operate on Honeywell, Inc.'s DPS 6 processors.

The drives offer a maximum storage capacity of 315M bytes and are compatible with Honeywell's MSU 9604 256M-byte drives. The drives

The Model CR-1810 costs \$695. A support rack of pens, paper, interface cable and tutorial software is also available from Comrex, 3701 Skypark Drive, Torrance, Calif. 90505.

are rack-mountable with interchangeable parts. An automatic lock protects read/write heads by locking the heads and disk platters when power is switched off.

The Parrot drives cost \$15,990, Knaus Systems said from 9950 W. Lawrence Ave., Chicago, Ill. 60176.

FROM THE AUTHORS OF Micro-DSS™/Finance and MicroModeller, NOW THERE'S

FEROX ENCORE!

FINANCIAL MODELING, DECISION SUPPORT (DSS),
GRAPHICS, REPORTING

&

ELECTRONIC SPREADSHEET

all on the IBM PC

and all for

\$695.00

ENCORE! is a comprehensive financial analysis, planning, reporting and decision support system specifically designed for the IBM PC and compatibles. ENCORE!'s capabilities compare with \$100,000.00 mainframe financial modeling systems, and many of its features cannot be found in any other software package regardless of price. ENCORE!'s unique strength is that it combines the popular features of an interactive spreadsheet with the extended capabilities of an English-style financial

planning language and decision support system. ENCORE! includes comprehensive graphics, goal seeking and consolidations, and the system's reporting capabilities allow for total user control. We honestly believe that you cannot find a more powerful and easier to use Spreadsheet/Financial Modeling/Decision Support system for the IBM PC at any price.

Call us today to find out more about ENCORE!

FEROX MICROSYSTEMS INC. • 1701 North Fort Myer Drive, Box F, Arlington, VA 22209
(800) 336-5496 • (703) 841-0800

INTRODUCING A LOOK INTO THE FUTURE

ESP/JSS — the new Execution Scheduling Processor. Now from Sterling Software Marketing. Here is the most versatile time-dependent job scheduling system yet... NOW you can have reliable predictions of system downtime effect on job scheduling. NOW you can specify schedules using different time zones. NOW you can specify simple and complex scheduling criteria with intervals ranging from 0.01 minute to years, decades — even a century. NOW you can change initiator classes at different times during the week and activate special over-night or weekend classes automatically... NOW you can have all of this and more with **ESP/JSS**.

For a free on-site evaluation, without obligation, call TOLL FREE 800-824-8512. California, Alaska, Hawaii, or Canada call collect 916-441-7234. Ask for ext. 41.

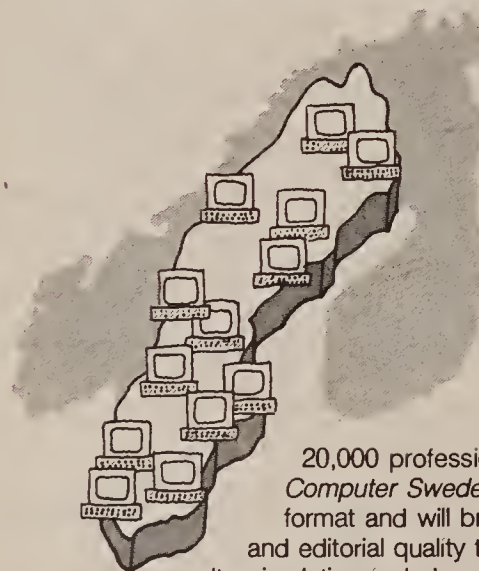


**STERLING
SOFTWARE
MARKETING**

Formerly Software Module Marketing

Crocker Bank Building/Penthouse
1007 Seventh Street
Sacramento, CA 95814

We've got the Swedish computer community covered. Have you?



In 1982, sales of computer hardware, software and services reached \$1.2 billion in Sweden. This market is expected to grow at an annual rate of 18% with the government and manufacturing industry being most effected.

And now our new sister publication, *Computer Sweden*, can bring your advertising message to

20,000 professionals in this expanding marketplace. *Computer Sweden* is published bi-weekly in a tabloid format and will bring *Computerworld's* high standards and editorial quality to the Swedish computer community.

Its circulation includes managers, marketing directors, engineering management at computer hardware, software and service suppliers, educators, consultants, DP managers and technicians.

CW International Marketing Services is your one-stop advertising service in countries around the computer world. For more information about *Computer Sweden* or any of our other foreign publications, just fill out the coupon below.

Diana La Muraglia

Manager, International Marketing Services

CW COMMUNICATIONS, INC.

375 Cochituate Road, Box 880, Framingham, MA 01701
(617) 879-0700

Please send me more information on:

☐ *Computer Sweden*

☐ Your other foreign publications

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____



CW COMMUNICATIONS, INC.
Publishers of *Computerworld* and other
leading computer publications around the
world.

Nuvec Laboratories Unveils Decentralized Micro Systems

LEXINGTON, Mass. — A family of supermicro and personal computer systems with decentralized hardware and software has been introduced by Nuvec Laboratories, Inc.

Nuvec Multex I and Multex II supermicros feature dedicated processor buses and decentralized multiprocessors that share a

common system bus to provide 6.3M bytes of random-access memory (RAM) for up to 32 users. Running on decentralized software, the micros include standard Unix programmer interfaces and built-in data base management systems.

The Multex I system includes a 157M-byte Winchester disk, while the Multex II combines a 315M-byte disk with a 16-channel, 1,200 bit/sec full-duplex modem for a total network capacity of 1,024 users. Multex II is expandable to 17,000M bytes.

Running under IBM Personal Computer software or Digital Research, Inc.'s CP/M 86, the Nuvec personal computer features up to four quad-density, double-sided 5¼-in. diskettes or hard disks and up to 983K bytes of RAM.

The Nuvec Multex systems start at \$25,000 and the personal computer at \$18,000, with the price depending on configuration and options. Nuvec Laboratories is located at 429 Marrett Road, Lexington, Mass. 02173.

Disk Extends Micro's Storage

PRINCETON, N.J. — Floppy Disk Services, Inc. has announced the FD-PC8, which the company said is an 8-in., double-sided disk drive that adds 2.5M bytes of on-line storage capability to the IBM Personal Computer.

The FD-PC8 is said to be one-half the height of standard disk drives and offers IBM mainframe interface capabilities, the vendor said.

The unit is available in both single and dual system configurations for \$1,095 and \$1,495 respectively from Floppy Disk Services, 741 Alexander Road, Princeton, N.J. 08540.

Workstation With Logic Unit Completes Idea 1000 System

PORTLAND, Ore. — Mentor Graphics Corp. recently announced a workstation that incorporates a logic analysis system into its Idea 1000 computer-aided engineering system.

The company said the Midas 7000 completes the automation of digital hardware design by bringing hardware verification and test to the existing capabilities of schematic entry/capture, design simulation and physical layout.

The logic analysis system is controlled through the Idea 1000 workstation's graphics-oriented user interface that controls other system tools, and the unit features an expandable architecture that will accommodate other digital test instrumentation, a company spokesman said.

The Midas 7000 takes real-time "snapshots" of the digital activity taking place inside a computer-based product as it executes software, providing two types of information: a record of the logic states produced by the software/hardware interaction, and a record of the timing relation-

ships between the various digital control lines.

The logic analysis system is priced at \$14,900 and will be available for shipment in the first quarter of 1984, according to Mentor Graphics. Additional information is available from Mentor Graphics, located at 10200 S.W. Nimbus Ave., G7, Portland, Ore. 97223.

Timex Offers Color Micro

WATERBURY, Conn. — Timex Computer Corp. has announced the 2068 color microcomputer.

The unit features 72K bytes of internal storage divided into 48K bytes of random-access memory and 24K bytes of read-only memory. The unit can be used for word processing, entertainment and educational applications, the vendor said.

The 2068 costs \$199.95, Timex Computer said through P.O. Box 2126, Waterbury, Conn. 06720.

How far would you like your data processing distributed?



Whether you need to keep information flowing across the hall or around the world, here's an important consideration. Thousands of the world's most successful companies have already selected Nixdorf as the best computer company for the job.

Nixdorf makes it simple to tie all your offices together into one efficient network. And, we have the experience, products and support capability to keep information flowing in banking, insurance, government, retailing, transportation and other specific industries.

International businesses demand software systems that are at home anywhere. And only Nixdorf can offer COMET International, a total business information system with over 10,000 installations in 30 countries. COMET International is a valuable contributor because it has capabilities in seven foreign languages and 19 currencies, and also meets the demands of local accounting principles and exchange rates.

For 31 years, Nixdorf has been providing solutions for the information processing needs of all kinds of businesses. And today, we're a successful international company with 16,000 people and over 110,000 computer systems installed around the world.

So no matter how far you want to go, remember Nixdorf. We're making it a small world for some of the world's largest companies.

Nixdorf Computer Corporation,
300 Third Avenue, Waltham, MA 02154

NIXDORF
COMPUTER

Everyone In The UNIX^{*} World Will Gather At



UniForumTM

The International Conference of UNIX Users

JAN. 17-20, 1984 • WASHINGTON HILTON • WASHINGTON, D.C.

If you are already a part of the UNIX world . . . or want to know more about UNIX . . . UniForum is the one place you should be January 17-20, 1984.

Twenty-seven conference sessions . . . all of the major UNIX vendors . . . and anyone-who-is-anyone in the UNIX community will be at the Washington Hilton for UniForum.

Begin with an all-day tutorial on Tuesday . . . hear a distinguished keynote speaker on Wednesday . . . and follow these features with informative sessions presented by /usr/group and USENIX on Wednesday, Thursday and Friday.

Exhibits will be open Tuesday, Wednesday and Thursday.

Use the registration form on this page to sign up today!

TUTORIALS

TUESDAY, JAN. 17

ALL-DAY SESSIONS — 8:30 a.m. to 5 p.m.

- ① **Software Contracts & Licences**
Speaker: Susan H. Nycum, of Gaston, Snow, Ely Bartlett; Palo Alto, CA
- ② **C Style and Portability**
Speaker: Eric Allman, of Britton-Lee; Los Gatos, CA
- ③ **UNIX Systems Administration**
Speakers: Ed Gould and Bob Kridle, of Mt. Xinu; Berkeley, CA
- ④ **Advanced Shell Programming**
Speaker: Steve Bourne, of Silicon Graphics Inc.; Mountain View, CA
- ⑤ **Vi Editor**
- ⑥ **UNIX Systems on Local Area Networks**

EXHIBITS

UniForum will present the largest showing of UNIX-related hardware, software and services . . . ever.

Every major vendor of UNIX-related items will be exhibiting. Western Electric (AT&T) is exhibiting.

Displays fill the Washington Hilton's big exhibit hall and overflow to adjoining areas.

Use the form below to register today and save \$5 (on-site registration is \$10 . . . advance is \$5).

/usr/group SESSIONS

WEDNESDAY, JAN. 18

- ⑦ Keynote Address — 9 a.m.-10 a.m. ⑧ Joint Session — 10:30 a.m. to Noon

- ⑨ Fifth Generation Computer — 1:30-3 p.m.
⑪ UNIX Market Research — 3:30-5 p.m.

THURSDAY, JAN. 19

- ⑬ UNIX Micro to Mainframe Communications — 8:30-10 a.m.
⑮ UNIX Graphic Work Stations and Applications — 10:30-Noon
⑰ Standards for UNIX & C — 1:30-3 p.m.
⑲ UNIX and Entertainment — 3:30-5 p.m.

FRIDAY, JAN. 20

- ⑳ Office Automation Case Studies And New Products Using UNIX — 8:30-10 a.m.
㉓ UNIX Microports and Western Electric — 10:30-Noon
㉕ Ada and UNIX — 1:30-3 p.m.

- ㉔ Database Systems — 8:30-10 a.m.
㉖ Graphics — 10:30-Noon
㉗ Open Session — 1:30-3 p.m.

- ㉘ Joint Session — 3:30-5 p.m.

The Washington Hilton is located at 1919 Connecticut Avenue, N.W.

Regular shuttle bus service is available from both Dulles Airport and Washington National Airport to the Washington Hilton.

HOTEL: For Washington Hilton Hotel reservations, call: 202-483-3000.

AIRLINE: Save Up to 40% on airline tickets! Call: 800-323-9128 (in Illinois and Canada, call 312-323-9128).

**UNIX is a trademark of Bell Laboratories.*

REGISTRATION FORM

To Register for Show (Exhibits) Only: Fill In Section A & Enclose Check or Money Order For \$5.

To Register for Show AND Conferences: Fill In Entire Form.

Sponsored by



Co-Sponsored by

USENIX Association

A

Name	
Title	
Company	
Address	
City	
State	
Zip	
Telephone (Area Code)	
Electronic Mail Address (one only):	

B SELECT SESSIONS YOU WISH TO ATTEND:

All-Day Tutorials	Conference Program — Please circle sessions you wish to attend to help us in planning adequate seating.					
TUESDAY (Select One:)	HOURS	WEDNESDAY	THURSDAY	FRIDAY		
1 2 3	8:30 - 10 a.m.	7†	13 14	21 22		
4 5 6	10:30 - Noon	8	15 16	23 24		
	1:30 - 3 p.m.	9 10	17 18	25 26		
	3:30 - 5 p.m.	11 12	19 20	27		

†Keynote; session begins at 9 a.m.

C CONFERENCE & TUTORIAL FEE SCHEDULE

TUTORIAL:
(Tuesday, all-day tutorial) \$100
Student rate \$ 50

CONFERENCES:
(Wed., Thurs. & Fri. — includes admission to exhibits)
Member of /usr/group and/or USENIX \$100
Non-member \$125
Student rate \$ 50

TOTAL \$

D Method of Payment: ☐ Payment Enclosed (Make check payable to UniForum)

Charge to my MasterCard ☐ Visa ☐ American Express ☐

Account Number:

Expiration Date: Signature:

U.S. Government & Military personnel please note: Payment or purchase order must accompany registration.

ADVANCE REGISTRATIONS
MUST BE POSTMARKED BY DECEMBER 30, 1983

To register after December 30, 1983, register at UniForum at the Washington Hilton. On-site fees are \$50 higher. On-site registration fee to attend exhibits only, \$10.

MAIL TO:
UNIFORM - Suite 205 - 2400 E. Devon Ave - Des Plaines, IL - 60018

North Star's Dimension Works With IBM Micros

(Continued from Page 117)

tem include one 360K-byte floppy disk drive and one 15M- or 30M-byte fixed disk drive. Add-in spaces for a second fixed disk drive and an integrated tape backup subsystem are also included, the vendor said.

The main processor board is equipped with 256K bytes of random-access memory (RAM), which is expandable to 512K bytes. This memory is used primarily as cache memory to speed up the interaction between the user and the hard disk drive. In addition, each workstation board includes 128K bytes of RAM, which is also expandable to 512K bytes. The workstations also come with a local RS-232 interface to connect a local printer or mouse device, according to the vendor.

A two-workstation system, including the CPU, 256K bytes of RAM, a 360K-byte floppy disk drive and a

DEC Falcon Gets Cmos Expander From Infosphere

PORTLAND, Ore. — Infosphere, Inc. has announced the FMX-11 complementary metallic oxide semiconductor (Cmos) memory expander for the Digital Equipment Corp. Falcon single-board computer.

The company said the FMX-11 will extend the Falcon's on-board memory capacity to 60K bytes, add battery support for Cmos static random-access memory and provide a Cmos calendar clock and power failure detection logic with battery backup. The product will allow users to develop and execute real-time applications in process control, data acquisition and energy management.

According to a vendor spokesman, the FMX-11 supplies address, data and control signals at on-board, memory-cycle speeds, and it retains data during a power failure. The unit's programmable read-only memory address decoder allows the system integrator to link any combination of 2K-, 4K- and 8K-byte memory chips for a total of 60K bytes. It is a dual-width, Q-bus board in two versions, one that supports the company's Sphere application development software and another that supports DEC development software.

The single-unit price is \$700 from Infosphere, 4730 S.W. Macadam Ave., Portland, Ore. 97201.

15M-byte hard disk, costs \$7,000. The same configuration with a 30M-byte hard disk costs \$8,000. Each workstation module costs \$1,500. A 15M-byte add-in hard disk drive costs \$2,000, and a 30M-byte hard disk costs \$3,000. The tape backup add-in module costs \$3,000. Expansion memory boards for the workstation and central module range from \$300 for a 128K-byte board to \$700 for a 384K-byte expansion, the vendor said.

The Dimension system will be available in the first quarter of 1984. More information is available from the vendor at 14440 Catalina St., San Leandro, Calif. 94577.

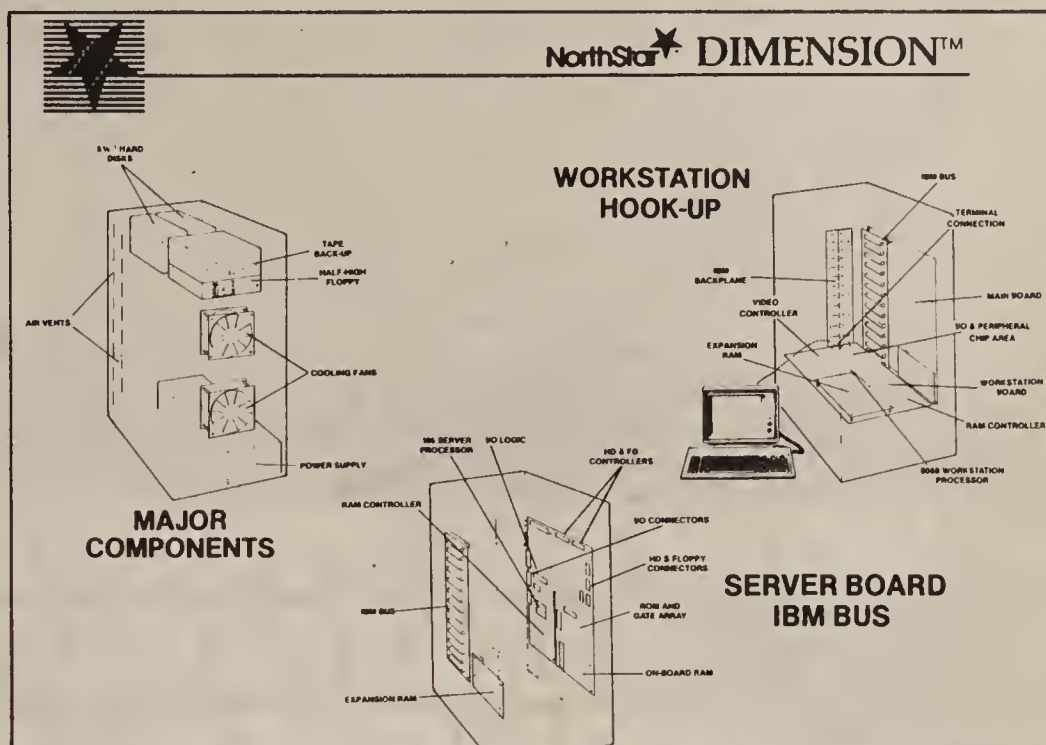


Chart Courtesy North Star Computers

North Star Computers, Inc. Dimension

CPX à la Carte

THE FOURTH-PARTY MAINTENANCE CO. SM

Total support capability.

Only at CPX will you find one source for everything you need to keep your disk drive on line.

With every order, you get a whole menu of unbeatable **SERVICE** and **QUALITY**. Our 40,000 sq. feet of facilities and multi-million dollar inventories give you **FAST SHIPMENT** - almost always within 24 hours.

Our stock of new disk drive consumables includes: media, spares, subassemblies and the largest inventory of new disk heads, alignment packs and absolute filters anywhere. And, if there's a particularly scarce part we don't have in stock,

our **FREE** Locator Task Force will find it for you! That's **SERVICE CPX Style!**

CPX's great line of **QUALITY** consumables:

- * DISKETTES - CPX + DYSAN
- * DISK HEAD CLEANING KITS
- * PRINTWHEELS
- * PRINTWHEEL CLEANING KITS
- * PRINTER RIBBONS

CPX total support includes **REPAIR** of complete disk drives and sub-assemblies - disk heads, circuit cards and head positioners with **FAST TURNAROUND**. Mechanical subassemblies - motors and spindles - are **REFURBISHED** and returned within 5 days! This service includes bench and system testing and a full 90-day warranty, effective from the First day of use!

COMBINATION SAVINGS

Combined multi-product user discounts bring even lower costs to CPX products and services. Your CPX REP. has details.

WORLD-WIDE EXPORT SERVICE

Our international blanket export license permits direct shipment world wide.

IF YOU DON'T SEE WHAT YOU NEED, CALL US !!!

CPX
THE FOURTH-PARTY MAINTENANCE CO.

CORPORATE OFFICE:

19821 Nordhoff St. • Northridge, CA. 91324

Phone: (213) 341-3783 • Telex 18-1537

N.E. REGION: (201) 756-8040 • S.W. REGION: (713) 661-3424



'I Like It. It's . . . American!'



**“WITH VAX WE CAN BUILD
MARKET SHARE
ANYWHERE WE SEE
AN OPPORTUNITY.”**

—John J. Clancy, Senior Vice President, Industry and Product
Management, McDonnell Douglas Automation Company

"VAX has tremendous market pull," says John Clancy. "It's the only computer that could help a company this size achieve the ambitious growth rates we've set. Last year, our CAD/CAM operation grew 80%. We couldn't have done it without VAX™ computers."

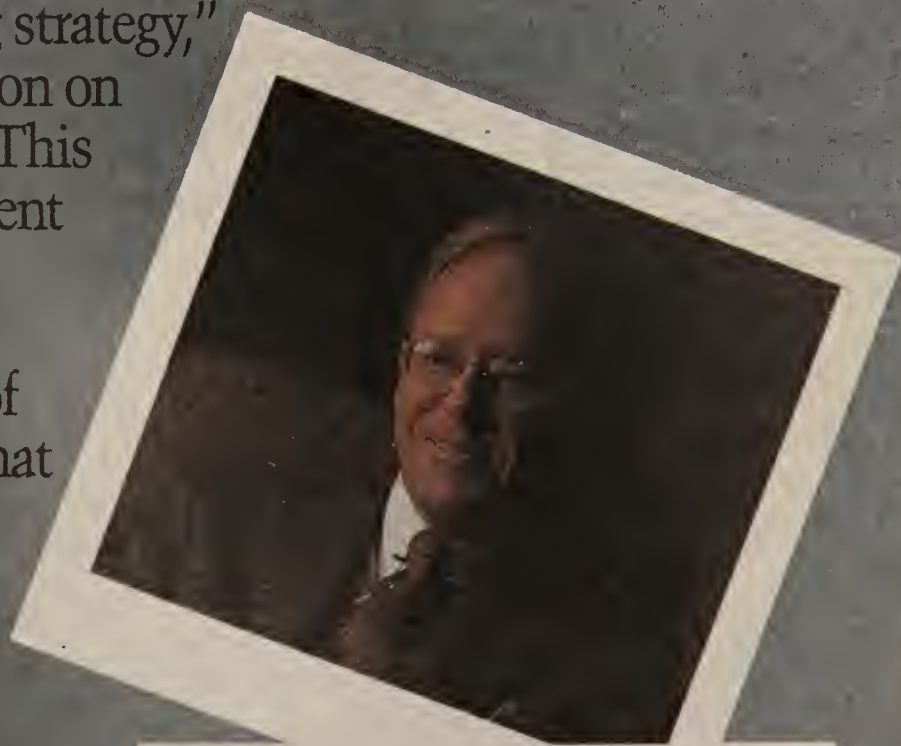
VAX

MCAUTO designs applications that run on standard hardware and software systems. "VAX and the VMS™ operating system are ideal for an OEM with this marketing strategy," says John Clancy. "We can layer any application on VAX without fundamentally changing it. This way our customers can use the equipment later for additional applications—and increasingly they want to."

From an OEM's point of view, John Clancy believes that Digital provides essential strengths. "From market penetration to continuing customer support, the company is solid," he observes. "Their products are constantly growing and improving. They let us in on their long-range plans, and that allows us to make long-range plans."

"When we enter a market, we do so with the intention of becoming a leader," he says. "VAX is clearly the leader in 32-bit computers. That's why we buy it. That's why we're so enthusiastic about selling it. It's a pure productivity story."

What market would you like a share of? For more information on VAX systems, call 1-800-DIGITAL, extension 200. Or write: Digital Equipment Corporation, 200 Baker Avenue, Attention: Media Response Manager, CF01/M95, West Concord, MA 01742.



MCAUTO, a division of McDonnell Douglas and one of Digital's largest commercial OEMs, supplies applications software to health care, robotics, architecture, CAD/CAM and other industries. SYSTEM ONE, the company's newest engineering management package, is being offered exclusively on VAX computers.

digital

Both letter-quality and draft hard copy

Fastest document throughput in its class

Both friction and tractor paper feed

Industry standard serial and parallel interfaces.

Better, more versatile operator controls

TI reliability

Compatibility with third-party and proprietary software

Better, more durable easy-access font modules

Introducing the TI 855 microprinter. No other printer says better so many ways.

Feature for feature, no other microprinter can match the versatility, compatibility, reliability and productivity of the OMNI 800® Model 855 microprinter. Here's why.

Two Printers In One. With the TI 855 you get the speed of dot matrix draft copy. Plus the precise clarity of the most advanced matrix technology for letter-quality print. It's two printers in one — at one low price.

A Great Family Name. Texas Instruments is known for providing the world with the industry standard for printers — the TI 810. TI builds the same reliability into every 800 series microprinter. Both the 855 and the data processing Model 850 are part of the expanding TI line of high-performance, low-cost microprinters.

Hardware Compatible. The TI 855 microprinter is compatible with all major PC hardware. And it provides both serial RS232C subset and "Centronics-type" parallel as standard interfaces.

Software Compatible. The TI 855 uses industry standard escape sequences for compatibility with virtually all third-party software. And for those with proprietary software needs, a model is available with ANSI standard escape sequences.

Tough Font Modules For Quick Character Change. Three font modules can be inserted into the front of the printer at one time, and are accessed individually. Each contains both draft- and letter-quality character sets. They're easier to use, more reliable and more durable than traditional metal or plastic daisy wheels.

More Productivity Than Any Other Microprinter. The 855 offers both friction and tractor paper feed, to handle all types of word and data processing applications. A quick-change snap-in cartridge ribbon. Raster and mosaic graphics. And intelligent printing which maximizes document throughput — regardless of format.

Get the printer that makes for better information systems. For more information visit your nearest TI authorized dealer or write Texas Instruments Incorporated, P.O. Box 402430, Dept. DPF-00000, Dallas, TX 75240. Or call toll-free: 1-800-527-3500.

**TEXAS
INSTRUMENTS**

Creating useful products
and services for you.



Computer-Aided Design System Supports Apple

NEWTOWN, Pa. — Chesell-Robocom Corp. has introduced the Robographics CAD-1, a computer-aided design system.

The new package connects to the Apple Computer, Inc.

Apple II or Apple IIe micro and produces scaled, technical drawings and custom graphics. Designers, illustrators, educators and other business professionals can use the system to create

building plans, mechanical drawings, schematics, flowcharts and business graphics.

The CAD-1 system works with standard, off-the-shelf Apple computers. A complete hardware/software

configuration, including plotter, is available at a starting price of \$4,920.

The system uses a handheld controller to draw lines, circles, arcs and tangents to exact dimensions. Once completed, commonly used symbols and finished drawings are stored on library diskettes and are displayed in miniature for easy recognition and reuse through a graphics index system, the

vendor said.

Two Robographics drafting plotters are available to produce drawings up to 22 by 34 in.

The price of the CAD-1 software, controller and user manual is \$1,095. The product line is currently available through Apple Computer dealers or directly through the vendor, located at Suite 2B, 125 Pheasant Run, Newtown, Pa. 18940.

Price Cut on Tape Backup System

SUNNYVALE, Calif. — Davong Systems, Inc.'s tape backup subsystem, which safeguards data from any Winchester or floppy disk drive used with IBM Personal Computer or Personal Computer XT microcomputers, has been reduced to \$1,775, including interface.

The stand-alone streaming tape drive uses a ¼-in. tape cartridge with a formatted capacity of approximately 18M bytes. An adapter for the backup plugs directly into an IBM Personal Computer or Personal Computer XT expansion slot.

Software capabilities include initial checkout, copying from floppy or hard disk to tape and restoring files from tape to hard or floppy disk. It also can compare file dates so that the most current file with the same title is restored, the company said. Files may be restored to a different volume, and an index lists names and dates of all backup files.

Using the Davong Multi-OS control system, backup can be done by volume or by individual file. A 15M-byte disk can be copied in about four minutes, the company said, and there are four error-

checking methods.

More information about the tape backup system can

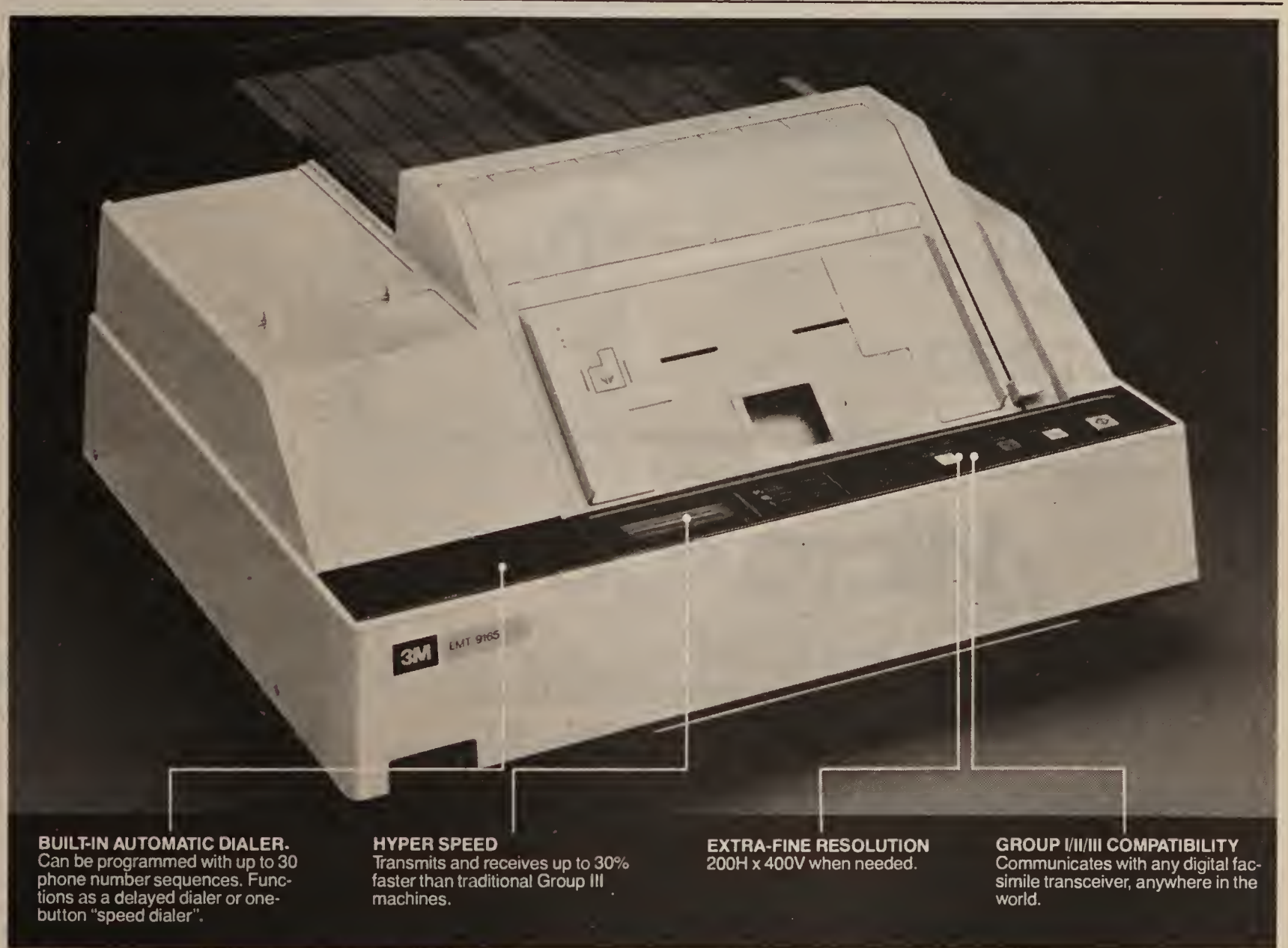
be obtained from Davong at 217 Humboldt Court, Sunnyvale, Calif. 94086.

SBE, Inc. Upgrades Disk Drive

EMERYVILLE, Calif. — SBE, Inc. has announced a Motorola Corp. 68000-based hard disk drive, the SBE 200, which includes a 5¼-in. Quantum 40M-byte Winchester disk drive. The new system is an upgrade from the standard SBE 200, which includes a 10M-byte Winchester disk drive and a 5¼-in. floppy disk.

The Quantum hard disk drive has a capacity of 42.6M bytes of unformatted data or 36.8M bytes of formatted data. Its average access time is 45 msec. Other features of the Quantum drive include a proprietary embedded wedge servo, a rotary voice coil, industry standard interface and a standard mini-floppy form factor.

The price of the SBE 200 with the 40M-byte Quantum drive is \$6,000 from SBE at 4700 San Pablo Ave., Emeryville, Calif. 94608.



BUILT-IN AUTOMATIC DIALER.
Can be programmed with up to 30 phone number sequences. Functions as a delayed dialer or one-button "speed dialer".

HYPER SPEED
Transmits and receives up to 30% faster than traditional Group III machines.

EXTRA-FINE RESOLUTION
200H x 400V when needed.

GROUP I/II/III COMPATIBILITY
Communicates with any digital facsimile transceiver, anywhere in the world.

INTRODUCING 3M's EMT 9165:

The first in a new series of modular facsimile terminals for the 1980s and beyond.

When you equip your central and branch offices with EMT 9165 digital facsimile transceivers from 3M, you aren't just getting easy-to-use fax machines that will work with all of your present Group I, II, and III equipment. You're also getting an automated facsimile network that can slash your long-distance transmission costs dramatically through their advanced productivity-enhancing features.

The EMT 9165's dual polling mode is a good example. It lets you do either of two things: (1) poll other Group III machines in the usual way, or (2) send traffic to and obtain documents from

other EMT 9165s with a single call to each machine, so that you eliminate the added expense of double phone calls.

3M's EMT 9165 also helps to lower communication costs by providing a detailed audit trail through two types of status reports, including one that supplies a department or personal ID number for each call.

Other major features include: Automatic time and date stamping of incoming and outgoing traffic. Alphanumeric display for prompting casual operators and to help in programming the machine for "one-button" operation. Two-digit ID numbers as pass-

words, if required.

Special Applications: Modular design. 3M-I computer store-and-forward system that interfaces with data networks and supporting protocols such as SNA, HDLC and X.25.

For details on the new EMT-9165 and the full line of 3M electronic message terminals, call 1-800-328-1684 toll-free. (In Minnesota, 1-800-792-1072.) In Canada, call 1-800-268-9055, Operator 11. Or mail the coupon to: 3M Business Communication Products Division, 3M Center, Building 216-2N, P.O. Box 33600, St. Paul, MN 55144
Attn: G. Collins.

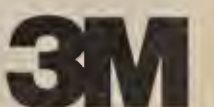
I want information on 3M's state-of-the-art EMT 9165 and the growing 3M EMT 9165 network.

Name	_____
Title	_____
Company	_____
Address	_____
City	_____
State	_____ Zip
Phone ()	_____

COW 11-14

Business Communications Products Division

3M hears you...



Holmes' Portable Drive Fits TRS-80 Model 100

SALT LAKE CITY, Utah — Holmes Engineering, Inc. has introduced the PMD-100 portable micro drive for the Radio Shack TRS-80 Model 100 portable computer.

The PMD-100 allows the Model 100 to save and load programs and files at high speeds using miniature continuous-loop tape cartridges.

The portable micro drive is a battery-operated system

which is reportedly a natural companion to the Model 100 computer. Rechargeable batteries allow several hours of portable operation. The PMD-100 fits with the Model 100 into a standard briefcase.

The drive is attached to the Model 100 RS-232C connector via a coiled telephone cord. The operating system is then downloaded to the Model 100, using the built-in

Telcom software in the Model 100. The operating system then resides in the Model 100's nonvolatile memory.

The operating system provides a menu for the operator's convenience. A program or file may be saved to the tape or loaded from the tape into the Model 100 by single key commands executed from the menu.

Operation of the drive is

similar to operation of a floppy disk. The operator first inserts a tape cartridge into the micro drive. Files may then be saved or loaded, a spokesman explained.

A directory of all files on a cartridge may be displayed on the Model 100's screen. A file may be deleted from anywhere on a tape, and another file may be put in its place.

The PMD-100 operates at 9,600 bit/sec, and a 16K-byte random-access memory buffer in the PMD-100 makes file

transfers fast and efficient, the company claimed.

The portable micro drive retails for \$349.95. Included with the package are five wafer tapes, a battery charger, a cable to connect the drive to the Model 100 and operating instructions. A cable to allow the Model 100 to operate from the battery in the PMD-100 is also included.

More information is available from Holmes at 5175 Green Pine Drive, Salt Lake City, Utah 84107.

Conversions. On Time. Within Budget. Call 800-558-5148*

- COBOL to COBOL
 - FORTRAN to FORTRAN
 - DOS ALC to OS ALC
 - Universal File Translator
 - RPG/RPG II to COBOL
 - CCP to CICS
 - NEAT/3 to COBOL
 - File Compare Utility
- * Plus FREE "Conversion With No Surprises" brochure.

DASD

PEOPLE/PRODUCTS/RESULTS
DASD Corporation • Corporate Services Center
9045 North Deerwood Drive • Milwaukee, WI 53223 • 414-355-3405

Member of the Cap Gemini Sogeti group

*In Wisconsin, call 414-355-3405, collect.

MicroAge®

**"THEIR ENTHUSIASM ABOUT OUR GROWTH
IN ALASKA WAS CONTAGIOUS...IN LESS
THAN TWO YEARS WE'VE EXPANDED INTO
FOUR COMPUTER STORES!"**

"MicroAge's enthusiasm was catching! The same can do energy that started MicroAge during the pioneering days of microcomputing is now a matter of company policy."

"Plus, MicroAge helped us get key product lines for Alaska!"

"We're believers in MicroAge. Their industry knowledge and insight into recent product developments has given us the flexibility to think and react before our competition does. We started with 4 people in a single store in 1981...now we have 4 stores and 26 people."

"At MicroAge, they speak our language...success!"

Jay Wisthoff

Jay Wisthoff
MicroAge Franchisee

Tom Hunter

Tom Hunter
MicroAge Franchisee

To build your own professional computer sales organization with MicroAge, write to:

MicroAge®
COMPUTER STORES
"The Solution Store" ®

1457 West Alameda • Tempe, Arizona 85282

(602) 968-3168



Imaging System Aids Designers, Engineers

MOUNTAIN VIEW, Calif. — Silicon Graphics, Inc. has introduced the Integrated Raster Imaging System (Iris) workstation, which allows designers and engineers to manipulate two- and three-dimensional designs. The

unit can be used in a stand-alone environment or in multiterminal networks.

The workstation was designed for advanced design and engineering applications among the mechanical sector, including: automobile, aircraft, machine tool, mining and farm equipment industries, electronic systems and components, architecture, engineering and construction, scientific, animation, film and graphics, a spokesman said.

Some product applications include complex three-dimensional wire-frame and shaded-solids modeling, engineering analysis and simulation, geophysical modeling, printed and integrated circuit layout, schematic capture, animation and document preparation and medical imaging applications.

The price for a stand-alone workstation is \$59,500, and the price of a terminal is \$37,500, the spokesman for the vendor said.

Further information is available from Silicon Graphics, which is located at 630 Clyde St., Mountain View, Calif. 94043.

Gould's UPS Touts 2.5 kVa

SAN DIEGO — Gould, Inc. has unveiled a 2.5-kVA uninterruptible power supply (UPS), the Model 7026.

The Model 7026 is available in either a 14-in., rack-mountable package or in a 40-in.-high cabinet including 15 or 45 minutes of battery reserve.

Gould's 7000 series utilizes bipolar transistors switching at 25 kHz. The 2.5-kVA model, which includes a built-in static transfer switch, is available in either 120V, 220V or 240V versions at 50Hz or 60Hz.

Prices of the 7000 series UPS start at \$5,995 from Gould, Power Conversion Division, 2727 Kurtz St., San Diego, Calif. 92110.

Card for Apple III Allows Extra Devices

CUPERTINO, Calif. — Apple Computer, Inc. has announced the Apple Serial Card III.

According to the vendor, the Serial Card III is for Apple III users who require more than one serial communications device.

By inserting the card into one of the Apple III internal slots, a user can communicate with a variety of modems, plotters, printers and other serial RS-232C communications devices without disconnecting or reattaching any of the system's cables.

Depending on the user's communications require-

ments, up to four cards can be used at once. The card enables users to perform multiple communications tasks, such as printing documents, while simultaneously communicating with another computer via modem.

If a user requires only one serial communications device, it can be connected directly to the built-in serial port on the Apple III's back panel.

The Apple Serial Card III is available now at a price of \$225. More information is available from the vendor at 10260 Bandley Drive, Cupertino, Calif. 95014.



What happens in the computer industry in 1984 will profoundly affect the way you do business. This January 2nd Computerworld is going to give you a very educated guess on how it will all fall out.

Computerworld's annual review and forecast issue will examine some of the major events of 1983 and put them in perspective. But this year the stronger emphasis is on what's *going* to happen in 1984:

- The January 1 divestiture of AT&T. What will the impact *really* be?
- When is the shakeout going to come in the Micro market? Who will the big players be and who'll be dropping out?
- The results of the *Computerworld* DP Budget Survey: Where is the DP/MIS exec's money going to go? Why?
- Technology. Just what are the R&D people *actually* working on?

Last year's software announcements and/or agreements will be looked at in light of

which will come to reality in 1984. You'll get a close look at control, security and training issues and how they'll impact DP/MIS managers who spent 1983 off-loading applications to end-users and providing them with computing power.

The entire editorial staff of *Computerworld* is working full time to review the key events of 1983 and how they'll affect your business in 1984. So you'll get all the insight you need to do your strategic planning for the year ahead.

If you've got product or service ads that will help our readers make informed choices for 1984 — then you need to get color ads to us by December 9th and black and white ads to us by December 15th.

To reserve space in the combined December 26th/January 2nd special issue, call one of the sales offices listed below, or call Don Fagan, Vice President Sales/Marketing; Ed Marecki, National Sales Director or Kathy Doyle, Marketing Support Manager.



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Sales Offices

Boston/Chris Lee, Jayne Donovan, Mike Kelleher, Ron Mastro, Jim McClure, Alice Longley, (617) 879-0700

Chicago/Newt Barrett, Art Kossack, Chris Lee, Jean Broderick, (312) 827-4433

New York/Mike Masters, Doug Cheney, Ray Corbin, Joan Daly, Fred LoSapio, Gale M. Paterno, (201) 967-1350

Atlanta/Jeffrey Melnick, Mike Masters, (404) 394-0758

San Francisco/Bill Healey, Ernie Chamberlain, Theodora Franson, A.G. Germano, Barry Milione, Nicole Bookman (classified), (415) 421-7330

Los Angeles/Bernie Hockswender, Bob Hubbard, Bill Healey, (714) 261-1230

Targets Micros

Multimode Matrix Printer Unveiled

CHARLOTTE, N.C. — Datasouth Computer Corp. has unveiled the DS220, a multimode matrix printer for most popular microcomputers.

The unit provides correspondence-quality, as well as word processing and draft-quality printing, the vendor said.

In a correspondence mode, the DS220 generates an 18- by 48-dot matrix and can print at up to 40 char./sec. For print-intensive applications, the DS220 can operate at up to 220 char./sec, with a maximum throughput of 450 line/sec. In this mode, the unit prints on a 9- by 7-dot matrix and offers a selection of pitches, ranging from 10 to 16 char./in. The

unit can also operate in an expanded print mode, producing between 5 and 8 char./in., the vendor said.

The DS220 features 50 programmable features including forms con-

trol, print mode and communications.

The printer costs \$1,995, Datasouth said from 4216 Stuart Andrew Blvd., Charlotte, N.C. 28210.

Touch-Sensitive Screen Fits IBM

ALBUQUERQUE, N.M. — Computer Technology Associates (CTA) recently announced a touch-sensitive screen and interface for IBM Personal Computer monitors.

The IBM-compatible Soft-Touch utilizes infrared emitter-sensor array technology and is accessed directly through the IBM Personal Computer Basic compiler without extra assem-

bly language routines, according to a CTA spokesman, with the Basic program reading the X and Y coordinates of the moving command.

The screen provides a resolution of 96 horizontal by 64 vertical pixel points, the spokesman said.

Available in January, Soft-Touch costs \$695 from CTA, 1704 Moon N.E., Albuquerque, N.M. 87112.

Keyboards Out For Radio Shack, IBM Micros

SPOKANE, Wash. — Key Tronic Corp. has announced a version of its enhanced plug-compatible IBM Personal Computer keyboard that offers the Dvorak keytop layout. Also announced was a replacement full-travel keyboard for Radio Shack's TRS-80 Color Computer.

The Model KB-5150D reportedly is directly plug-compatible with either the IBM Personal Computer or Personal Computer XT and offers additional features such as familiar placement of the Shift and Return keys, an Enter key next to the numeric pad and indicators on the locking mode keys. The KB-5150D has a suggested price of \$269.

The model's Dvorak layout, named after its inventor, August Dvorak, was recently endorsed by the American National Standards Institute. The home row of the Dvorak keyboard reportedly can configure 3,000 word combinations as compared to the standard Qwerty keyboard's 100.

The Model KB-500 keyboard for the TRS-80 was designed to upgrade the functional efficiency and capabilities of the microcomputer. It is said to provide a 15% to 20% higher data input rate. Other features include a user-programmable function key, complete legend description, familiar typewriter layout and full sculptured keytop array with low profile keys. Suggested retail price for the Model KB-500 is \$89.95.

Key Tronic can be reached through P.O. Box 14687, Spokane, Wash. 99214.

PC11 Boasts Compatibility With PDP-11

HOUSTON — Abacus Technology Systems, Inc. has announced a Digital Equipment Corp. PDP-11-compatible peripheral computer for S-100 bus-based computer systems.

The PC11 reportedly allows users to run PDP-11 software on Digital Research, Inc.'s CP/M-based microcomputers. It includes the DEC RT-11 operating system and CP/M interface software. It also offers the PDP-11 user a method of adding additional systems based on some of the inexpensive S-100 systems currently available.

The PC11 is a T11 microprocessor-based unit with 64K bytes of on-board memory. The unit plugs into existing S-100-based computers and utilizes the existing processors and peripherals for I/O. The use of 8-in. soft-sectored disks will allow media compatibility with DEC PDP-11 series minis for program interchange, the vendor said.

The package includes the RT-11 operating system, CP/M-based I/O interface program source supplied on 8-in. floppy disk media and supports console, printer and dual disk drives, the vendor said. The PC11 introductory price is \$795.

Abacus is located at 8343 Carvel, Houston, Texas 77036.



SERIX™

High Performance UNIX™ Program for the IBM Series/1.

SERIX provides lower software costs plus these outstanding advantages:

A long term avenue for growth

- AT&T licensed UNIX Program — The Coming Standard
- Software portability
- Access to a large, growing software base
- Real-time extensions

Increased programmer productivity

- Programmer's workbench
- Large set of utilities
- Hierarchical file structure
- Synchronous, asynchronous and delayed processes

Delivers more power from the Series/1

- Optimizing C compiler uses native code features
- All code reentrant
- Swapping — multiple concurrent users
- Addresses the full megabyte of memory on the 4956 processor
- Disk interleaving capability

Included subsystems:

- Networking
- Electronic Mail
- Word Processing
- Resource Accounting

Optional systems:

- COBOL and other languages
- EDX-to-SERIX conversion package
- Database
- Spreadsheet
- SNA Communication
- The vi visual editor

CMI Corporation is an IBM Master VAR. Leasing and other financial arrangements available.

Contact CMI for more information:

CMI CORPORATION

755 W. Big Beaver, 19th Floor, Troy, MI 48064
TWX/TELEX: 810-232-1667 CMI CORP TRMI
(313) 362-1000

A Torchmark Company
Member CDLA

ADDs Viewpoint/Color from your point of view.

EVEN BOSSES NEED A LITTLE COLOR.



Right out of the box, the new ADDS Viewpoint/Color brings extra clarity and comprehension to any business application. Bosses like that.

They also will like the ergonomically designed detachable keyboard with its separate key cluster for numeric entry and cursor control. And the display screen which tilts from a minus 5° to a plus 15° and swivels a full 360° for comfortable viewing.

But should only a boss deserve color?

The full-featured ADDS Viewpoint/Color costs less than many monochrome terminals so there's no reason not to let color improve your communications company-wide. That makes nine good reasons to buy ADDS Viewpoint/Color terminals. Red, blue, green, yellow, cyan, magenta, white, black and price.

IT ALL ADDS UP.

ADDs

Applied Digital Data Systems Inc.
A Subsidiary of NCR Corporation

100 Marcus Blvd., Hauppauge, New York 11788

Available From Computer Ideas

HP 3000 On-Site Courses Launched

CHICAGO — Computer Ideas Ltd. has announced a series of on-site operational training courses for Hewlett-Packard Co.'s HP 3000 superminicomputer.

Source 2 UPS Introduced By Topaz

SAN DIEGO — Topaz, Inc. has introduced the Source 2 uninterruptible power supply (UPS). The unit was designed for protecting word processors, point-of-sale terminals and other small computer-based equipment against power outages.

The Source 2 provides up to 60 minutes of steady ac power to enable critical equipment to continue operating, even during blackouts. Source 2 output is a sine wave that exactly matches the wave shape of commercial power. This makes the units suitable for use with virtually any type of system, the vendor said.

Each Source 2 UPS consists of a battery, a battery charger, a sine wave inverter, a power monitor and a high-speed transfer switch. When commercial power is present, the Source 2 system filters the power, providing protection against electrical noise and voltage spikes, according to the vendor.

If primary power is lost or if voltage drops more than 15% below nominal, the Source 2 automatically begins supplying ac power from energy stored in its battery, according to the vendor.

The transfer from primary power to battery power occurs in approximately four msec, so the protected equipment experiences no discontinuity of power. When commercial power is restored, the protected equipment is automatically switched back to the power line, and the UPS begins recharging its battery, according to the vendor.

Source 2 is available in power ratings of 200VA and 400VA in 50Hz and 60Hz models. Prices start at \$800, the vendor said.

More information is available from Topaz at 9192 Topaz Way, San Diego, Calif. 92123.

Courses available include "The HP Environment," "System Management," "Introduction to HP's Image Data Base," "Image Optimization," "Cobol Optimization" and a variety of others, a spokesman said.

The courses run from two to five days and cost from \$560 to \$1,400 per person.

The firm also offers a series of advisory services that

help users evaluate different computer systems. These services are tailored for each user and are priced according to the time involved. For example, a five-day evaluation program costs about \$1,600, the spokesman noted.

Additional information on these and other services can be obtained from the firm at 4559 W. 64th St., Chicago, Ill. 60629.

Lifeline Power Supply Bows

ADDISON, Ill. — Instrumentation and Control Systems, Inc. has introduced the Lifeline uninterruptible ac power supply.

Lifeline was designed to provide continuous power for microcomputer system users, according to the vendor.

The "no-break" power feature provides voltage regulation and line filtering plus an inverter that supplies power only during power

outages, with no interruption to the critical load, the company said.

An internal battery handles the full power of the system for five to 10 minutes, while an external battery may be used to extend operation for one hour or longer if required.

A 200-VA system is priced at \$1,042 from Instrumentation and Control Systems, 520 Interstate Road, Addison, Ill. 60101.

CAN YOU FIND THE IBM* 3278 HIDDEN IN THIS PICTURE?



It's right there.

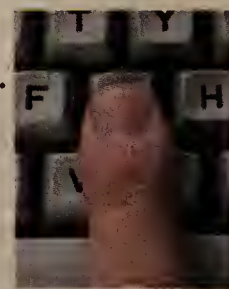
Inside the Advanced Personal Computer from NEC Information Systems.

In fact, the Advanced Personal Computer is the best personal computer for direct connect 3278 emulation, with 3274 and 3276 controllers.

Get the advantages of personal computing plus direct connect 3278 emulation.

With the APC, your people will be more productive than ever before.

They can easily perform all their existing 3278 applications. Then, with a single keystroke, switch to a full function personal computer, quickly



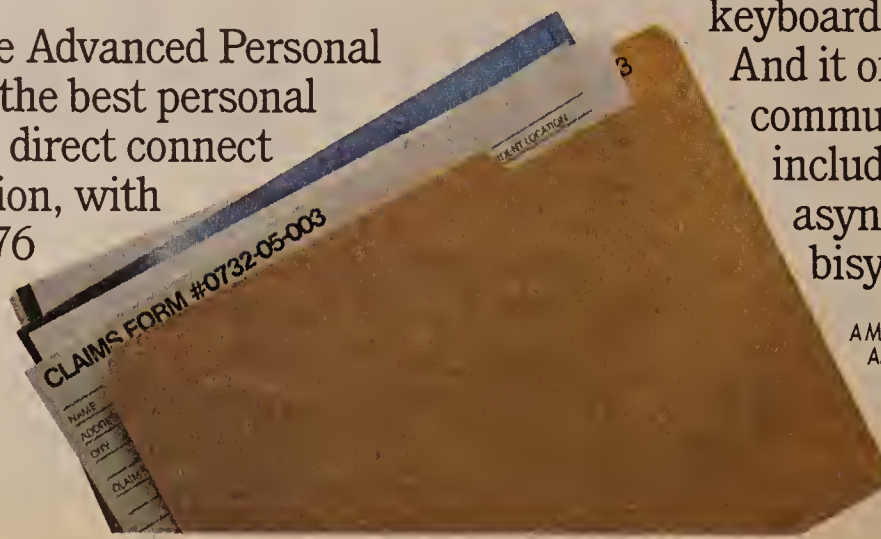
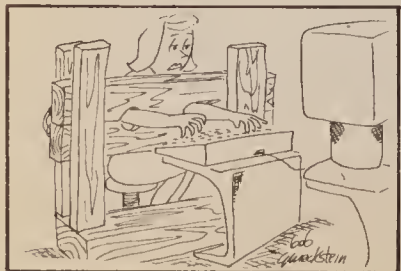
WITH A SINGLE KEY-STROKE, YOU CAN SWITCH FROM 3278 EMULATION TO A FULL FUNCTION PERSONAL COMPUTER.

and easily.

And the APC is fully compatible with all 15 different 3278 keyboard configurations.

And it offers a full range of communications protocols, including SNA/SDLC, asynchronous and bisynchronous.

A MAJOR INSURANCE COMPANY IS USING THE ADVANCED PERSONAL COMPUTER TO GREATLY INCREASE WORKER PRODUCTIVITY.



Controller, Slave Board Designed for S-100

SACRAMENTO, Calif. — Teletek Enterprises, Inc. has announced the release of two S-100 board products — a hard disk/cartridge tape controller and a slave board.

The Hard Disk/Cartridge Tape Controller (HD/CTC) reportedly can interface two Shugart Technologies, Inc. ST-506-compatible, 5¼-in. hard disk drives and a Qic-02 cartridge tape drive to an S-100 system. An intelligent

controller, it has a Zilog, Inc. Z80A CPU, 8 bytes of random-access memory (RAM) and 16K bytes of read-only memory (ROM). Hard disk drives of 5¼-in., 8-in. or 14-in. can be interfaced to a number of tape backup devices. The HD/CTC costs \$795 each, a spokesman said.

The SBC-11 slave board utilizes Software 2000's Turbodos software and is said to support two users. Each user

is provided with a Z80A (optional Z80B) CPU, 64K bytes of RAM and 2K bytes of erasable programmable ROM (expandable to 32K bytes). Each CPU has one associated Z80A serial I/O providing two RS-232C-compatible serial ports, the vendor said. Each CPU has one 8-bit interrupt vector/status register and one 6-bit command register. Independent addressing of the S-100 I/O space is

accomplished via user-selectable jumpers. The SBC-11 slave board costs approximately \$1,395, a company

spokesman said.

Teletek is located at 4600 Pell Drive, Sacramento, Calif. 95838.

Adapter Fits IBM Micros, Provides Graphics Aid

MILPITAS, Calif. — Micrographics Technology, Inc. has announced an adapter for the IBM Personal Com-

puter or XT said to replace three IBM adapters with a single module and to provide graphics functions currently unavailable by any other means to IBM computers.

The Mastergraphics 1 adapter reportedly provides Personal Computer and XT users with extra slot space while extending the graphics power of their machines. It is part of the modular Mastergraphics System, which is fully compatible with all personal computer hardware and software from IBM.

The device is said to increase active colors from four to 16, quadruple the display storage provided by the IBM adapters from 16K bytes to 64K bytes and allows higher resolution in color and monochrome — 640 pixels by 200 pixels (16-color) and 768 pixels by 340 pixels (monochrome).

Functions include Masterpalette, an adapter that increases available colors to 4,096, Masterset Programmer hardware and software to allow any user to generate custom character sets quickly and a Dual Display kit for simultaneously attaching a color and a black-and-white monitor to the IBM micro.

The Mastergraphics 1 adapter costs \$579, from Micrographics at 1820 McCarthy Blvd., Milpitas, Calif. 95035.

Own for less than you pay in rent.

With all this functionality, you'd probably expect to pay a small fortune for the APC. Surprise! The APC can be purchased for less than 1 year's rental charges on a 3278.

Which means you can offer your people a lot more functionality and *still* pay less.

Software, software, and more software.

With the APC, you can choose from hundreds of different software applications programs.

You can get word processing, forecasting, spreadsheets, database management and much more. In fact, we probably have a software program for any need you might have.

3278

YOU CAN OWN AN
NEC ADVANCED PERSONAL
COMPUTER FOR LESS THAN THE
COST OF LEASING A 3278 FOR 1 YEAR.

Find out more about NEC's Advanced Personal Computer.

For more information about the APC, or for the location of your nearest NEC representative, call 1-800-343-4419.

And find out why so many 3278 users are saying "NEC and me".

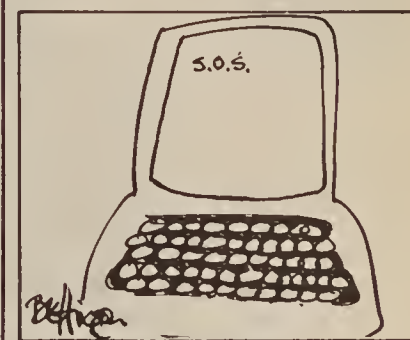
**NEC
AND
ME**

NEC Information Systems, Inc.
5 Militia Drive, Lexington, MA, 02173

WITH THE ADVANCED
PERSONAL COMPUTER,
DESKS ARE LESS
CLUTTERED AND
PEOPLE ARE MORE
PRODUCTIVE.



THERE ARE
HUNDREDS OF
PERSONAL COMPUTER
SOFTWARE PACKAGES THAT
RUN ON NEC'S ADVANCED
PERSONAL COMPUTER.



**Abuser Friendly
Report Processor
For IBM/38?**

Managerial support
software that is truly
easy to use.

Call or write for more
details on FUSION 4/38.

FUSION
PRODUCTS INTERNATIONAL

(415) 381-1340
PO Box Fusion
Mill Valley, CA 94942
Telex 176099 FUSION

It's just not fair to claim that **TEMPLATE[®]** is the best graphics software available. Our competition's already discouraged.

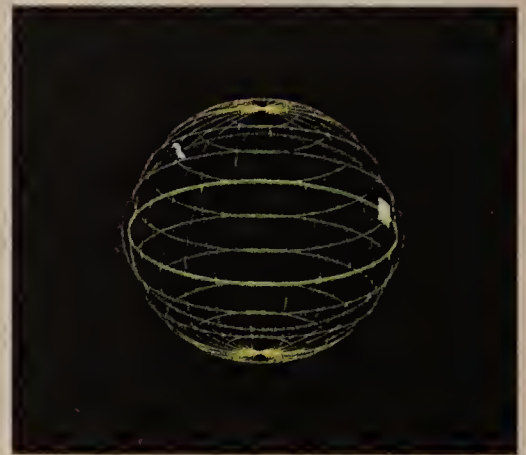
And we like competition. We really do. It's just that it's difficult, if not impossible, to find graphics software as efficient and functional as TEMPLATE. Try as you might. TEMPLATE is the hands-down winner. With true device-independence and intelligence, total graphics functionality for CAD, scientific analysis, seismic work, process control, molecular modeling, and a host of other applications.



In almost any environment, whether it's batch or interactive, 2D or 3D, TEMPLATE wins. Benchmark tests prove it. TEMPLATE, besides being a true 3D graphics package for 32-bit or larger computers, features powerful commands that provide matchless productivity. TEMPLATE makes optimal use of available computer resources, giving you fast, efficient computer graphics program execution. And it supports over 125 graphics devices, from dumb termi-

nals to sophisticated systems.

We also provide on-site installation and training, continuous updates, a regular flow of new device drivers, and ongoing documentation. What's more, we back you up with a telephone hotline so TEMPLATE software specialists can provide help if you need it.



But let's be fair. If you're looking for graphics software, call our competitors first. Find out what they have to say about theirs. Then call us, and find out why TEMPLATE really has no competition.

And why the competition has been so discouraged for so long.

 **MEGATEK
CORPORATION**
A UNITED TELECOM COMPANY
Making History out of State-of-the-Art

Reach Out to End Users, DP Managers Told

By Bill Laberis
CW Staff

BALTIMORE — To borrow a phrase from a popular commercial, DP shops should reach out and touch someone — and that someone is the end user, who is more and more often threatening to design and implement his own office system if the DP department won't make an overture to help.

That was the message at the recent conference of the Data Processing Management Association, where DPs got an earful of strategic ideas for gaining more control over the implementation of office automation, even when this implementation is largely out of their purview.

"Make certain you have your people available to the OA people on a friendly basis. Don't try to bulldoze your

'Make certain you have your people available to the OA people on a friendly basis. Don't try to bulldoze your way in.'

— Mary M. Greenwood, consultant.

way in," advised Mary M. Greenwood, consultant with Greenwood and Associates of Baltimore and a speaker at one of the conference seminars.

Mary Greenwood and Frank Greenwood outlined a shopping-list approach to effective DP interaction with the user community in implementing office systems. Their approach was designed to combat the implementation of patchwork systems that can result when design is carried out without some centralized planning.

Their approach was also intended to confront what some end users see as DP's refusal to

share computing power with non-DPs. Said one end user at the seminar, "People are going out and buying micros, getting answers on their own, while the DP department is still spinning its wheels. End-user computing is a fait accompli, so DP had better get used to it."

According to the Greenwoods, DPs are often perceived as oriented more to their technology than to the organization that employs them and its goals. Thus, when management looks for someone to implement the concept of information as a corporate resource — one that

is to be managed accordingly — there are often reservations about involving DP managers in the process, the existing systems investment notwithstanding.

The Greenwoods' recommendations for effective DP strategy in office systems implementation included:

- Help end users develop a long-range plan. DPs are accustomed to doing this with their systems strategies.

- Let end users know what is feasible. Frank Greenwood said that users "see a television ad and think they can do just about anything with computers."

- Help end users prepare a commercial solicitation to gauge what the vendor community has to offer.

- Help implement the solution chosen, standing by with technical assistance.

Of Total Office Integration

WP, E-Mail Seen Only the Beginning

By Jim Bartimo
CW Staff

CHICAGO — Word processing and electronic mail are the baby steps toward total office integration, according to consultant Susen S. Kay.

Kay, who is senior consultant for Hannagan & Associates, Inc. of Schaumburg, Ill., addressed a session on office integration at the Integrated Office Technology Conference and Exposition held here recently. She also reviewed some current integration technologies and predicted what the future may bring.

Among various electronic mail systems on the market today are facsimile, communicating word processors, telex and TWX, store-and-forward systems, voice messag-

ing and computer-based message systems (CBMS), such as IBM's Professional Office System.

"You will see CBMS take over for many of these technologies," Kay said. "One of the ways CBMS will become the prevalent electronic mail system is when it is used to connect the user to an information inquiry data base. This connection gives users access to both word processing and a selected category of corporate data."

One major step to office integration will be connecting electronic mail to the data base and tying the data base to the word processing system to complete the circle, Kay said.

Kay also noted that the data processing department must become involved in order for office automation to become truly

integrated with the corporate data base. For example, "99% of the data base used here is from the data processing department," she said.

Referring to some other emerging office technologies, Kay predicted that Wang Laboratories, Inc.'s Professional Image Computer and other image processors will have little immediate impact on office integration, but called combination terminal/telephones "one of the slickest things to hit the hardware market."

Although combination terminal/telephones represent mainly a hardware integration and not necessarily a functional integration, Kay suggested that "just because we're not integrated to the point we want to be doesn't mean you can't get some benefits out of what is there."

Matrix Printer Operates In Three Modes

CHARLOTTE, N.C. — Datasouth Computer Corp. recently announced a matrix printer that operates in three modes with micro- and mini-based systems.

The DS220 multimode matrix printer provides multiple type fonts that may be selected using the operator panel or the program control. Included as standard are two correspondence-quality fonts, two memo fonts, variable-pitch draft fonts and micro character set as well as seven international character sets, a vendor spokesman said.

In correspondence mode, the device generates "near letter-quality" 18- by 48-dot matrix at 40 char./sec; in high-speed print mode, the device operates at 220 char./sec with a nine- by seven-dot matrix; a graphics feature reportedly is able to print up to 217 columns for spreadsheets.

The printer is priced at \$1,995, and more information is available from Datasouth, 4216 Stuart Andrew Blvd., Charlotte, N.C. 28210.

Enhanced Version of Decmail Gives Word-11 Users E-Mail

ANAHEIM, Calif. — Data Processing Design, Inc. has announced an enhanced version of Digital Equipment Corp.'s Decmail designed to provide users of the vendor's Word-11 word processing software with electronic mail capability.

Decmail Plus, a menu-oriented package, is said to run on DEC's RSTS/E operating systems equipped with Word-11, allowing users to create and store documents or messages or send them to other terminals or users within their com-

puter system.

Decmail Plus reportedly allows users to send messages either to specified terminals, specified users or to all users within either a single computer system or a network of computers.

The introductory price for Decmail Plus for users operating under RSTS/E is \$3,500 for the first license and \$1,750 for secondary licenses. More information is available from Data Processing Design, 1400 N. Brasher, Anaheim, Calif. 92807.

Wizard Mail Operates With CICS

GREENVILLE, S.C. — Steel Heddle Products, Inc. has introduced an electronic mail system for office automation applications.

Wizard Mail is said to operate with any IBM CICS or Vsam host computer. Uses of the system include the ability to broadcast messages to all computer users, optional automatic hard-copy printout of each message, confidential message recognition,

message priority assignments, status of mail sent, tracking recipients wherever they are signed on and monitoring the status of messages.

Wizard Mail is menu-driven and can reportedly be used on all terminals with access to host computer systems.

It is priced at \$495 from Steel Heddle Products through P.O. Box 1867, Greenville, S.C. 29602.

Package Lets VAX-11 Users Exchange Information

NEWPORT, R.I. — Aquidneck Data Corp. recently announced an office automation package said to allow Digital Equipment Corp. VAX-11 series users to exchange information between five different office application programs.

The VAX Office Exchange provides full transfer of information from one program to another and transfer of entire files and documents from one user to another.

All applications, including data base management system, word processing, spreadsheet, electronic mail and graphics are reportedly integrated into one menu that prompts the operator for successive commands.

The seven-module system can be purchased unbundled with individual prices ranging from \$2,000 to \$3,000. Aquidneck Data can be reached through P.O. Box 639, Newport, R.I. 02840.

WP Package Runs on Wang 220

RIGHTON PARK, Ill. — Basic Computer Services, Inc. has announced a word processing package for use with spreadsheets, electronic mail and client data base files.

Perfect Composer operates on Wang Laboratories, Inc. 220 computers and includes global editing, margin, tab and pagination controls.

Integration Package Out

PROVO, Utah — Lytron Systems, Inc. has announced a microcomputer office integration package said to allow users to combine all data and applications software into one integrated, menu-driven system.

The Lytronet Office Integration Software (Lois) package reportedly allows a user to bring together and

integrate software from almost any source. The company said a user can move data among different software applications and move from one application to another without returning to the operating system.

The product also reportedly includes a variety of tools such as a calendar, calculator, scratch pad, phone manager and a talk facility. It can be configured for a stand-alone microcomputer or local-area network.

The package operates with Microsoft, Inc.'s MS-DOS operating system. It is available in a stand-alone version for \$1,495.

More information is available from Lytron Systems, 1675 N. 200 West, No. 2, Provo, Utah 84604.

Course Diskettes Cover Visiword

NAPERVILLE, Ill. — Deltak, Inc. has announced the availability of self-paced course diskettes to help IBM Personal Computer users teach themselves the key word processing functions of Visicorp's Visiword WP system.

"Teach Yourself Visiword on the IBM Personal Computer" reportedly helps users learn how to interpret and access menus, how to access functions and options, how to create a document on disk and how to edit documents, using menus and function keys.

Users of the course must have access to an IBM Personal Computer with a minimum of 64K bytes of memory running under DOS, at least a single diskette drive and an IBM video terminal.

Priced at \$70, the course is available from Deltak, East/West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

Series Targets Real Estate Execs

MCLEAN, Va. — PRC Realty Systems, a division of Planning Research Corp., recently announced a software package bundled with the IBM Personal Computer in a system designed for real estate executives.

The PRC Execupro Series includes four software application packages for residential financial analysis, sales management, accounting and word processing, a vendor spokesman said.

The IBM Personal Computer includes the UCSD P-system and 256K bytes of memory.

The complete package is available for \$6,300, and the software alone is priced at \$1,800.

More information may be obtained from PRC Realty Systems, 1500 Planning Research Drive, McLean, Va. 22102.



**1984
OFFICE AUTOMATION
CONFERENCE®**



**LOS ANGELES CONVENTION CENTER • CALIFORNIA
FEBRUARY 20-22, 1984**

SPONSORED BY AMERICAN FEDERATION OF INFORMATION PROCESSING SOCIETIES, INC.

OFFICE AUTOMATION & YOU

The 1984 Office Automation Conference, "Office Automation & You," will highlight the most recent advances in OA, as they affect your role as a professional, manager, or user. This is YOUR conference.

OAC '84, the leading annual conference in the office automation industry, offers you the opportunity to:

- * Learn more about OA; with over 45 Program Sessions, 8 in-depth Professional Development Seminars, and 6 Industry Workshops.
- * Hear authoritative speakers, including Keynote—David T. Kearns, President & CEO of Xerox Corporation.
- * See more than 150 major companies exhibiting their products & services.
- * View numerous new products and developments introduced at OAC.
- * Evaluate and compare specific products and services.

For additional information, complete the coupon below and send to:
OAC '84, AFIPS, 1899 Preston White Drive, Reston, VA 22091.

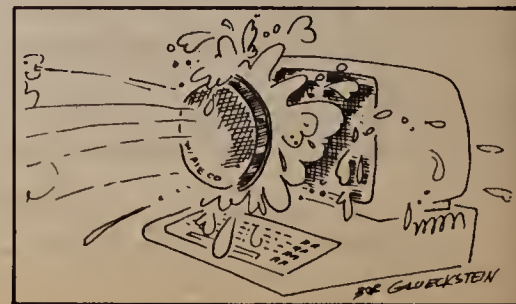
Or, REGISTER TODAY via our toll-free number: 800-OAC-1984, using American Express, MasterCard, or Visa.

For more information, mail this coupon today

Name: _____
Title: _____
Company: _____
Address: _____
City: _____ State: _____ Zip: _____

Mail to:

OAC '84
AFIPS
1899 Preston White Dr.
Reston, VA 22091



Industry Groups Pleased

House OKs Export Administration Bill

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The U.S. House of Representatives has approved an export administration bill that embodies many of the features sought by the electronics and other high-technology industries.

The bill, in the form of amendments to the 1979 Export Administration Act, which expired a month ago but remains in force through emergency-

powers authority invoked by President Reagan, calls for the government to rely much more on consultations with Congress and U.S. allies in setting and implementing export controls. It is also expected to ease restrictions on American exports to friendly countries, making U.S. firms more reliable suppliers in the eyes of overseas cus-

tomers.

The Senate has yet to act on its version of the export act amendments, and with congressional adjournment scheduled for the end of next week, it is unlikely the legislation can be completed this year unless, as is now expected, the House and Senate return for a final session in December.

"The House has passed something we're really happy with," commented Lloyd Kaufman, director of trade programs for the Computer Business and Equipment Manufacturers Association. In particular, he said, "industry was surprised" the House turned back a Defense Department bid to grab greater

(Continued on Page 158)

Boom in Small Computers Fueling Development of 3½-In. Microfloppy

By Robert Batt

CW West Coast Bureau

MENLO PARK, Calif. — The rapid growth of the small business computer market with its attendant shift to smaller desktop units and portable designs is accelerating the development of new data storage configurations.

One of the configurations that is receiving a lot of attention from industry analysts and manufacturers is the 3½-in. microfloppy disk, which some pundits predict will replace the traditional 5¼-in. minifloppy disk at the lower end of the computer range.

The 3½-in. microfloppy, pioneered by Sony Corp. and now manufactured by Hewlett-Packard Co., Shugart Associates, Tandon Corp. and Mitsubishi Corp., among others, recently received a major boost to its fortunes when IBM withdrew from the market its potential rival, the 3.9-inch disk.

The 3½-in. disk, which has the support of manufacturers comprising the Microfloppy Industry Committee, has a single-sided capacity of 500K bytes. It is said to provide the same storage capacities as the 5¼-in. systems but with a faster data transfer rate. Sony has also recently announced plans to pro-

duce a double-sided 1M byte microfloppy available in the second quarter of 1984.

According to HP, which has shipped over 25,000 3½-in. devices, reliability is four times better than the standard 5¼-in. minifloppy, due to its rigid case

and automatic shutter protection system.

HP claimed that by going to the 3½-in. system, it has been able to reduce prices by 30% in each of the last two years. As a result, the company said it has

(Continued on Page 154)

'We Goofed,' Olsen Says Of DEC Loss

By Bill Laberis

CW Staff

BOSTON — "I never thought I'd have to come here and explain why we goofed up. . . . It is hard to explain how a computer company can get into administration problems. Our sales pitch is that we will usually save you from these."

In this way, Kenneth Olsen, president of Digital Equipment Corp., kicked off the company's recent annual meeting as he

(Continued on Page 152)



CW Photo by B. Laberis

Facing the music, Kenneth Olsen, DEC president, makes a point at the company's recent annual meeting.

Sony Production Figures Illustrate Disk's Popularity

The rising popularity of the 3½-in. microfloppy disk is well illustrated by the production figures of its pioneer, Sony Corp.

In 1982, the first year of production, volumes at the Japanese manufacturer were a little over 5,000, according to Myles Tintle, general manager of Sony's Data Products Division. By the end of this year, the company expects to have shipped 140,000 of the 3½-in. units.

Furthermore, 1984 is anticipated as a take-off year for the company with volume shipments reaching over 600,000, the bulk of them to be used in personal and portable computers.

However, the trend to-

ward more end-user computing does not mean that in the mass storage market the 3½-in. disk will have the field all to itself. Several alternative technologies are also emerging, the most promising of which appears to be optical data storage.

According to its proponents, the cost of optical data storage per 1M byte should be considerably less than that of magnetic disk storage due to its potential for storing substantially greater amounts of data on a single optical disk than on a magnetic disk of the same size.

According to a report issued by Drexler Technology Corp., a Palo Alto, Calif.-

(Continued on Page 154)

Top Quarterback in the EDP

The Beall Channel Switch. To tell your computers where to get off . . . and on. Lets specific peripherals serve more than one computer. Gives you more usable redundancy, especially for critical on-line services. Provides far more flexible physical deployment of peripherals.

Why Beall?

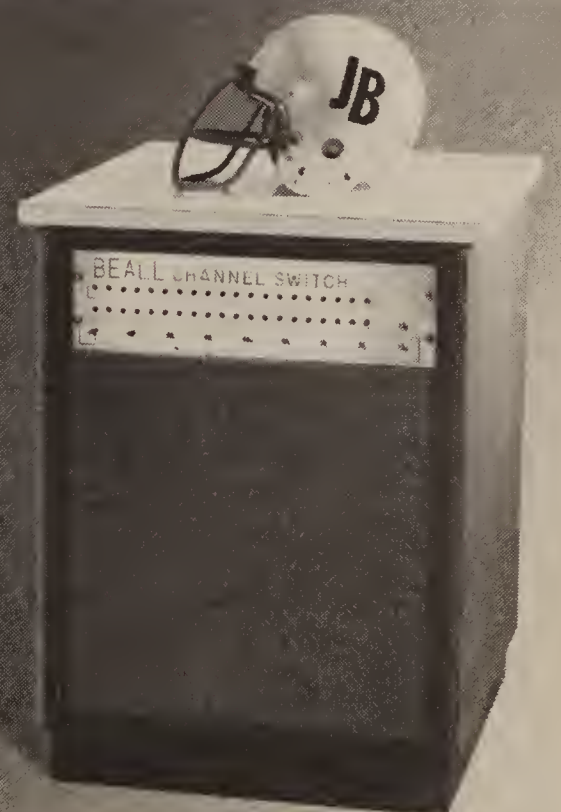
- 1 It's more reliable. Up to 94 per cent fewer circuit boards than the competition. Less to go wrong.
- 2 It's easier to operate. Simpler controls reduce chances of costly operator mistakes.
- 3 It's simpler to service. Self-diagnostic equipment is built in. Spare parts stocked on site.

We make five basic models to provide up to eight switchable interfaces each of which can be logically connected to as many as eight CPUs.

Oh yes, one more thing. Our "quarterback's" contract is the lowest in the league.

John Beall & Company, Inc.

9103 Third Avenue • North Bergen, N.J. 07047 U.S.A. • 201/854-3562



SEC Inquiring Into DEC Officials' Stock Sale

MAYNARD, Mass. — Three Digital Equipment Corp. officials, including the company's head of the personal computer group and its vice-president of finance, sold company stock the month before DEC announced its worst quarterly profits in seven years.

A DEC official confirmed last week that the Securities and Exchange Commission (SEC) has made inquiries into the stock sales, adding that such inquiries "are a matter of routine . . . whenever a company's stock value rises or falls sharply."

DEC's stock plummeted 30% on Oct. 18, the day the company announced its quarterly profits would fall 65% to 75% below the first quarter a year ago. The results were fol-

lowed by the filing of several shareholder lawsuits, which are presently in litigation.

The company verified the trading of three top officials, including:

- Joel Schwartz, chief of DEC's personal computer operations, who sold 1,000 shares — more than half his DEC portfolio — at the end of September. DEC's original earnings estimate blamed poor personal com-

digital
DIGITAL EQUIPMENT CORPORATION

puter sales for part of the dismal financial results.

- Edward A. Schwartz, vice-president and general counsel, who sold

2,400 of his 2,750 shares on Sept. 6.

- Alfred M. Bertocchi, vice-president for finance and administration, who sold 702 shares in mid-September, retaining 10,400 shares.

The DEC spokesman said company President Kenneth Olsen, who owns more than 2.4 million shares of DEC stock, "did not sell any recently, nor has he done so in years, as far as I know."

Administrative Problems to Blame: Olsen

(Continued from Page 151)

steered for the inevitable questions that would follow concerning DEC's sudden and dramatic fall from grace on Wall Street.

Speaking to nearly 400 shareholders, analysts and members of the press, Olsen cautiously told his audience that any failure by DEC to return to "normal" levels of profitability

can be blamed on "poor management." Five shareholder lawsuits lodged against DEC in recent weeks prompted Olsen's caution in discussing details of the firm's future financial performance, he said.

The suits followed the revelation that quarterly earnings for the mini-computer maker would fall 73% below earnings the same quarter a year earlier, which was also a relatively poor quarter. DEC's stock lost one-third its value the days following its earnings estimate, as investors and shareholders sought answers to the unexpected decline.

At the meeting, Olsen told them little they hadn't already heard and declined to elaborate much on what he termed the administrative problems that led to DEC's current problems.

The administrative problems, which resulted in inaccurate sales projections being transmitted to corporate management, were the product of "simply changing too many things at one time," Olsen offered. Order processing, in particular, suffered, such that some orders were counted twice and others were not recorded at the shipping point at all.

Asked by one analyst why administrative procedures decayed so rapidly, Olsen replied, "I can't explain why so many administrative groups [within DEC] should have changed at the same time."

Steering clear of explaining further details of DEC's administrative woes — which he said will be rectified within months — Olsen instead directed his prepared remarks largely at the company's product offerings, reiterating time and time again that DEC's commitment to technological excellence will restore the company to financial health. He shared the stage with a variety of DEC's newest products, including the yet-to-be-announced Microvax workstation.

But even when speaking of DEC's product lineup, Olsen was on the defensive, frequently rebutting criticism that the company has often been late in bringing certain products to market.

Olsen admitted that slack sales of the company's personal computers were caused in part by a lack of third-party software, admitting further that many independent suppliers will write for IBM's micros first and DEC later.

He also admitted that DEC's research and development team "made some false starts" in failing to apply a systematic approach in the developmental phase of a high-end VAX superminicomputer — to be announced next year.

**BEFORE YOU
SPEND HUNDREDS ON
INTEGRATED SOFTWARE,
SPEND 30 MINUTES
WITH US.**

"INTEGRATED MICROCOMPUTER SOFTWARE" A forum of experts. In a video format. Exclusively from Computerworld Reports.

Integrated microcomputer software is one late-breaking development you won't want to miss. And you can view this many-sided issue in a 30-minute videotape presentation—"Computerworld Reports: Integrated Microcomputer Software."

Watch experts like Elliot Friedman, Chairman/CEO Pro Computing; Thomas J. Gregory, President Ovation Technologies; and Steven Cook, Technical Editor of PC World with John Dvorak, former editor of InfoWorld. They'll chronicle the background and evolution of integrated software. Explore its effects at both end-user and corporate levels. And predict the future

of these increasingly sophisticated management tools.

CW Communications and DELTAK, inc. have developed this, the latest in a series of unique programs focusing on the products, techniques and trends that are changing your DP world. Coming soon from Computerworld Reports: more timely programs including applications development centers and computer security.

So to keep your eye on the issues, watch Computerworld Reports.

To order "Integrated Microcomputer Software," call DELTAK order entry at (312) 369-3000. In Canada (412) 678-9222.



DELTAK

East West Technological Center
1751 West Diehl Rd., Naperville, IL 60566
(312) 369-3000 (800) 532-7686



CW COMMUNICATIONS/INC.

375 Cochituate Road
Box 880, Framingham, MA 01701
(617) 879-0700

1983. A Very Good Year.

**NCR introduced the Tower,
a UNIX™ based microcomputer
with the power of a mini.**

Up to 16 users can access the Tower at the same time.

NCR designed the Tower for UNIX, today's de facto operating system standard for multi-user 16-bit microcomputers. Then NCR made a number of enhancements to make the Tower easy to use at any level of computer sophistication.

NCR added a full featured, menu-driven database that you create in English. The Tower can be programmed in BASIC, Pascal, COBOL, and FORTRAN as well as UNIX's own language, "C". Spreadsheets, word processing and color graphic software are available now from NCR as well as from third-party UNIX software developers.

The Tower can communicate with any existing computer system from desktops to mainframes. Communications capabilities include SNA, X25, RBS, Tower-to-Tower, and Tower-to-Terminal networking.



The Tower. A lot of power in a 29" x 27" x 7" box

Optional add-ons include a streaming tape drive for disk storage backup.

The Tower has power. Internal memory can be expanded to two million bytes, external storage from our standard 30 million to over 200 million. Its operating speed is an impressive 10 MHz. NCR enhancements include detailed diagnostics, battery backup, error correcting code and a new memory management system. A typical four-user configuration, including operating system and the "C" language, would cost only \$16,495.

The Tower is in volume production now.

In 1983 NCR introduced more new data processing products than any other high tech company. We wanted to get a good start on our second hundred years. For more information call your local NCR office, or 1-800-CALL-NCR. In Ohio, 1-800-543-4470.

NCR

Shaping the way business
does business for 99 years.

UNIX is a trademark of Bell Laboratories



Microfloppy Gaining in Popularity

(Continued from Page 151) shipped more 3½-in. units than its 5¼-in. and 8-in. disk drives combined.

"The new benefits of reliability, cost of ownership, size modularity and integrated appearance have given us an overwhelming customer acceptance, and for this reason we have committed that all floppy-based systems will use the 3½-in. microfloppy as their standard I/O device," a recent HP internal paper revealed.

The question of standards is a critical one for the future of the 3½-in. disk. Currently, there are four different standards being proposed for the microfloppy by the American National Standards Institute X3B8 technical subcom-

mittee. However, it is believed that many more 3½-in. units have been shipped to customers than the other sub-4-in. formats. Approximately 23 computer, peripheral and media manufacturers have endorsed the 3½-in. configuration.

"With the present trends and support of a large number of companies, the 3½-in. disk will probably become a de facto standard before official acceptance is granted,"

said Howard Dicken, president of DM Data, Inc.

The rapid growth of the 3½-in. unit is closely tied to the continuing expansion of the microcomputer market. According to one estimate, in 1982, 2 million personal computers were installed. By 1986, this figure is expected to climb to 12 million. Sony, for example, has just incorporated the 3½-in. disk in its first microcomputer, the SMC-70.

Success of Disk Backed By Production Figures

(Continued from Page 151) based company specializing in optical storage techniques, optical storage media is believed to have much longer data retention periods compared with disk storage.

"Optical data storage systems could have advantages over presently available media where a combination of data compactness, relatively

fast access, long storage life and relatively low cost per megabyte is desirable," according to the Drexler report.

Potential applications are believed to include auxiliary computer memory, archival storage of document images and data and information storage on credit and identification cards.

Apple Posts 69% Increase In Net Sales

CUPERTINO, Calif. — Apple Computer, Inc. reported a 69% increase in net sales to almost \$1 billion for the fiscal year ended Sept. 30. Earnings were up 25% as the company increased its spending by 77%.

Earnings increased to \$77 million, or \$1.28 per share, up from the \$61.3 million, or \$1.06 per share, reported in fiscal 1982. Net sales jumped to \$982.7 million for the year, which is in contrast to sales of \$583 million reported last year.

The company's increased spending was dramatically evident during the last quarter as sales grew 55% over the same period last year, but earnings were only \$5.1 million, or eight cents per share, compared to last year's corresponding fourth-quarter earnings of \$18.7 million, or 32 cents per share.

John Sculley, president and chief executive officer, reported that "market conditions and several strategic decisions which were made to strengthen the company" cut into the earnings increase.

During fiscal 1983, the company saw an increase in costs and expenses from last year's \$480 million to \$853 million. Spending for research and development rose to \$60 million from \$38 million; marketing and distribution rose to \$230 million from \$120 million; and cost of sales rose to \$508 million from \$288 million.

Sculley said the company ended the year "in a strong financial position" with \$143 million in cash, working capital of \$340 million, shareholders' equity of \$378 million and total assets of \$557 million.

NEW MATRIX PRINTER OUT PERFORMS ITSELF 3 TO 1.



H I G H P E R F O R M A N C E

Buyout Seen CDI's Main Hope

By Patricia Keefe
CW Staff

A buyout by a larger company hoping to gain a foothold in the micro marketplace is Computer Devices, Inc.'s main hope for survival following its Oct. 31 filing for bankruptcy, according to Alex Stein, senior analyst for Dataquest, Inc., a San Francisco-based research house.

A "modestly success-

ful" manufacturer of teletypewriters for 10 years, Computer Devices has made several attempts to enter the microcomputer market, according to Kenneth Bosomworth, president of International Resource Development, Inc. Seaforth M. Lyle, who recently resigned as company president, was encouraged by the board of directors to take a new run

at the market, Bosomworth added.

The "new run" resulted in the development of the DOT portable microcomputer, which has floundered because it does not meet the requirements of any specific user, according to Stein. In addition, he said the DOT offers users a 3½-in. disk as opposed to the standard 5¼-

(Continued on Page 156)

Computer Devices Files for Chapter 11, But Shop Still Open

By Patricia Keefe
CW Staff

BURLINGTON, Mass. — Computer Devices, Inc. became the second portable microcomputer vendor in less than two months to file for protection from its creditors under Chapter 11 of the U.S.

Bankruptcy Code. Court papers were filed Oct. 31 in U.S. Bankruptcy Court in Boston.

However, the vendor has not shut down operations. Rather, it plans to unveil an IBM-compatible version of its DOT portable microcomputer at the fall Comdex show later this month. A January delivery date is slated for the new micro, said to offer a 9-in. screen, 128K bytes of memory, double disk drives, an integrated printer and color port monitor.

Corporate counsel Mark Manski blamed the company's problems on a combination of some "internal marketing decisions" concerning the DOT, a lack of funds and a highly competitive marketplace.

"We were either ahead of our time by 12 months [by using a 3½-in. disk on the DOT] or we misread the public need for IBM compatibility. Actually, it's probably a combination of both," Manski said, referring to the inability of the DOT to run most IBM Personal Computer programs. "We really underestimated the dominant role of IBM, and it hurt us."

Employees Laid Off

As a result of the bankruptcy petition filed two weeks ago, 81 employees were laid off, leaving a work force of 129, according to Manski. In addition, Seaforth M. Lyle, company president and chief executive officer, resigned and was replaced by Executive Vice-President Robert J. Moore, who joined the firm in August.

Computer Devices has been in financial trouble for the last 12 months, laying off nearly 40% of its staff by August, Manski said. Bankruptcy papers were filed after "the company reached a level of cash insufficient to meet the payroll," he added. Efforts launched two months ago to find a merger partner to provide much-needed financial support had failed, although Manski claimed talks are currently under way with at least two potential suitors.

Also, although a public offering of shares in July netted the firm \$10.4 million, Manski said that \$6 million was paid immediately to the Bank of New England which, he added, has refused to advance the firm any more money.

Court documents filed by Computer Devices in U.S. (Continued on Page 156)

INTRODUCING THE NEW DS220 MULTI-MODE MATRIX PRINTER

In the beginning was the Datasouth DS180. A printer that defined high performance printing, with a balance of high technology design and mechanical simplicity. A high throughput printer that produced clean hardcopy under the most severe conditions.

Now there's the Datasouth DS220. A printer that raises those high performance standards and applies Datasouth technology to multiple printing tasks—all at one time.

The Datasouth DS220 redefines high performance for multimode printing the way the DS180 did for data quality printing.

For speed, the DS220 combines a 220 CPS print speed with servo-controlled logic seeking and high-speed tabbing over blank spaces. This allows the DS220 to zip instantly from one printable character to the next. In side-by-side tests of real-task performance—not just spec-sheet comparisons—the DS220 outperforms its rivals time after time.

For correspondence, the DS220 uses its 40 CPS bi-directional NLQ mode to form characters with the precision and clarity you would expect from a word processing printer.

And for graphics, the DS220 adds high performance artistry to popular microcomputer applications programs through high-resolution, dot-addressable output. Sharp new details emerge from business charts and graphs, and from engineering drawings.

The sum is even more than three printers in one. The DS220 offers a total of eleven different pitches and fonts along with seven international character sets. Plus non-volatile space for up to 64 do-it-yourself characters for downloading from the host computer.

And those are just the printing capabilities. In other respects, the DS220 outperforms not just itself but virtually every other printer on the market. Its front panel programming sets new standards in user friendly printer ergonomics. Its four digit LED display and push button panel allow programming of over fifty features, with a minimum of fuss and confusion. Those features include a variety of interface and communications selections that allow compatibility with a wide range of mini and microcomputers. And the DS220 handles six part forms with its adjustable tractor feed, as well as cut sheets and letterhead with its friction feed.

Best of all, the DS220 advances all the engineering, design and mechanical virtues established by its forerunner, the DS180. In the Datasouth tradition, the DS220 is made to run virtually nonstop in a wide variety of applications.

Test drive three high performance printers in one—the multimode DS220.

Call for details and the name of your nearest Datasouth sales/service distributor.

HIGH

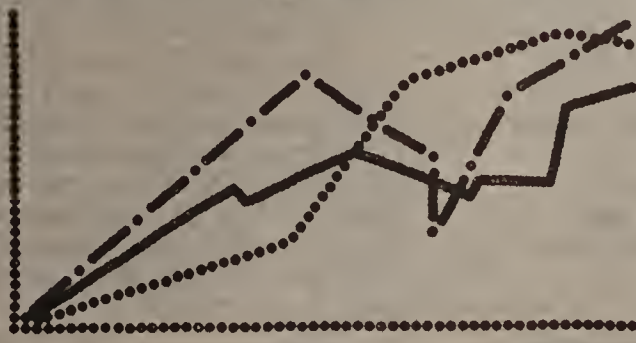
PERFORMANCE

HIGH

PERFORMANCE

HIGH

PERFORMANCE



datasouth

M A T R I X P R I N T E R S

Available nationwide through our network of sales/service distributors.
Datasouth Computer Corporation • Box 240947 • Charlotte, NC 28224
704/523-8500 • Telex 6843018 DASOU UW

Simulated output shown. Call or write to Datasouth for samples of actual output.

• UNICALC/DB™ • 3D MAINFRAME SPREADSHEET

Easy To Use
CICS, IDMS-DC NOW
UNLIMITED 3-D
Can Access DBMS

Expanded VisiCalc® Commands
Other TP (VM, TSO) In Process
Does Consolidations
Security & Control

INTRODUCTORY DISCOUNTS AVAILABLE



UNICALC CORP. • (215) 687-3485
160 Valley Forge Plaza • King of Prussia, PA 19406

Plans for Updated DOT Continue Despite Filing for Chapter 11

(Continued from Page 155)
Bankruptcy Court in Boston list total assets at \$18.6 million and liabilities of \$7.6 million. From a list of about 640 creditors, the vendor owes more than \$250,000 (\$346,196) to only one creditor, Sony Corp., according to Manski. Other creditors included Keytronic Corp., Future Electronics, Marshall In-

dustries and Digital Equipment Corp. Before the bankruptcy filing, some of the suppliers had halted equipment deliveries, Manski said.

The firm soon will file a business plan with the court, Manski said. Like portable micro vendor Osborne Computer Corp., which two months ago filed under

Chapter 11, Computer Devices is hoping to gain enough financial support to complete production of an upgraded, IBM-compatible version of its troubled portable, which it believes will solve most of its problems.

Unlike Osborne, Computer Devices does have another product line to fall back on, its Series 2000 line of thermal printers, which it concentrated on selling for about 10 years before testing the micro market waters.

Buyout Seen CDI Hope For Survival

(Continued from Page 155)
in. disk and, so, lacks compatibility with most of the available software.

As a result, the DOT was never able to attain a sufficient level of distribution and couldn't compete against any of the major IBM-compatible companies, such as Compaq Computer Corp., Bosomworth said. Agreeing that the small disks had caused problems, he noted they also add to a product's portability.

"Computer Devices has had a viable product line all along," Bosomworth said, adding that "a lack of customer enthusiasm and satisfactory distribution with the DOT" was the problem. Computer Devices' woes "demonstrate that it is very difficult to get a product positioned and distributed."

Stein maintained there is "no way" Computer Devices could compete in the battle for the corporate micro environment without the compatibility or standard the industry requires, particularly as more of the big-name vendors, such as IBM, Digital Equipment Corp. and Wang Laboratories, Inc., enter the business micro market.

While it is true that some of the smaller micro firms could turn a profit after only a few large-volume sales, Stein pointed out that they do not seem to realize how difficult it can be to land those sales.

INTRODUCING IBM'S NEW PERSONAL COMPUTER.



If your company has an IBM or IBM-compatible mainframe, you'll discover it's all the personal computer most of your end-users need.

Sure, right now they think they want a "real" personal computer. But their main priority is probably electronic spreadsheet capabilities for management planning. Other capabilities, like accounting or word processing, just aren't as frequently used or needed.

And you don't need problems with networking compatibility, mainframe communications, security and accuracy of vital corporate data, and the hidden costs of maintaining a large inventory of PCs.

OMNICALC™ TURNS EVERY TERMINAL IN YOUR COMPANY INTO A PERSONAL COMPUTER.

Now there's advanced spreadsheet software for your mainframe. One that's already been tried, tested, and loved by thousands of end-users. One that lets each of your end-users enjoy powerful forecasting and modeling capabilities without the expense and problems that come with personal computers.

OmniCalc lets managers easily analyze financial schedules, budgets, cash forecasts, planned expenses, sales forecasts, and a whole lot more.

And since OmniCalc is backed by the power of your mainframe, it's far more capable than the micro-based spreadsheets like VisiCalc.*

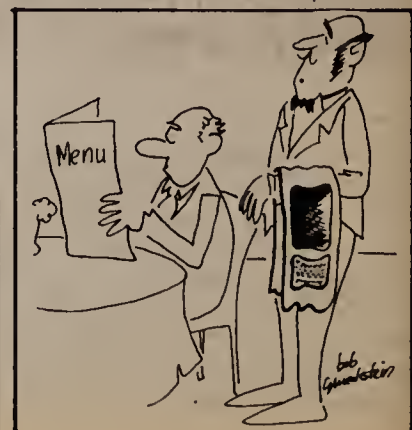
Of course, there are those in your organization who do need word processing and other capabilities. For them, we're working on an expansion of OmniCalc which will be available soon.

Discovering that you already own a large inventory of IBM personal computers can be highly profitable for your company. And so can all the other advanced software products powered by Tower. OmniCalc runs in CICS, VM/CMS or TSO environments. For complete details in California, Hawaii, and Alaska, call (714) 752-8263. In the rest of the continental United States, call toll-free (800) 854-7551. 19782 MacArthur Blvd., Suite 365, Dept. OCB, Irvine, CA 92715.

*VisiCalc is a registered trademark of VisiCorp.



**TOWER SYSTEMS
INTERNATIONAL**
Advanced Software Powered by Tower.



Having trouble getting personal with your personal computer?



Now that DELTAK and Cdex are together, learning is easier than ever.

Today you can teach yourself with a whole series of learning diskettes from not one, but two leaders in computer based training. DELTAK Microsystems and Cdex have joined together to bring you more courses, more ways to teach yourself than ever before.

Even if you've never touched a computer, you can learn practical applications for your IBM PC, PC-XT or PC compatible; Apple II+ or Apple IIe in just 60 to 90 minutes. There are even videotape courses on how to set everything up and start using your software.

And the new courses will keep on coming.

Like Making Business Decisions Using Electronic Spreadsheets, Teach Yourself VisiTrend/Plot and

many more. So isn't it time to get more personal with your personal computer? It's easy when you can teach yourself with courses from DELTAK and Cdex. Have questions? Lets talk.

Call 800-532-7686
In Illinois (312) 369-3000
Ext. 100

**Your
personal
computer
tutors.**



Here's what you can start teaching yourself now:

Produced by DELTA On Learning Diskettes

Teach Yourself the IBM PC

Teach Yourself VisiCalc on the IBM PC

Teach Yourself VisiCalc on the IBM PC: Extended Features

Teach Yourself WordStar on the IBM PC

Teach Yourself dBASE II on the IBM PC

Teach Yourself dBASE II on the IBM PC: Extended Features

Teach Yourself VisiWord on the IBM PC
Teach Yourself PC-DOS

On Videotape:

How to Get Started with Your IBM PC

How to Use Software on the IBM PC

Produced by Cdex On Learning Diskettes

Managing Your Business with Lotus 1-2-3

Training for VisiCalc

Managing Your Business with VisiCalc or VisiCalc Advanced Version

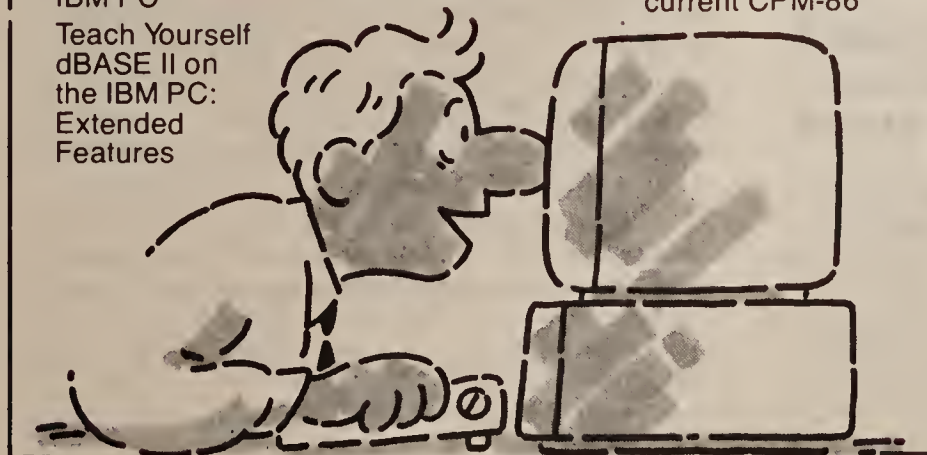
Managing Your Business with SuperCalc or SuperCalc²

Managing Your Business with Multiplan

Training for EasyWriter II

Training for the Apple IIe

How to Use Your IBM PC with CPM-86 and Concurrent CPM-86



DELTA Microsystems

A division of DELTAK, the world's leading computer educator for over 12 years.
East/West Technological Center, 1751 West Diehl Rd., Naperville, IL 60566

VisiCalc, VisiWord and VisiTrend/Plot are trademarks of VisiCorp. WordStar is a trademark of MicroPro. dBASE II is a trademark of Ashton-Tate. PC-DOS is a trademark of IBM/Microsoft. EasyWriter II is a trademark of IUS. 1-2-3 is a trademark of Lotus. Multiplan is a trademark of Microsoft. SuperCalc and SuperCalc² are trademarks of Sorcim. CP/M is a trademark of Digital Research.

© Copyright 1983, DELTAK, inc.

On Minimum Wage Requirements.

Federal DP Service Contract Exemption Issued

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The U.S. Department of Labor has issued its long-awaited exemption of federal DP service and maintenance contracts from government-imposed minimum wage requirements.

First proposed more than two years ago, the regulation exempts maintenance and repair of DP equipment, office systems and high-technology scientific and medical equipment from the provisions of the 1965 Service Contract Act.

That law was passed to protect primarily low-paid service workers from wage busting by employers try-

ing to win federal contracts. In 1977, Labor proposed to extend the act's coverage to other industries, including federal data processing maintenance.

A number of computer firms and the Computer and Business Equipment Manufacturers Association (Cbema) have been fighting the proposal ever since.

Those firms argued that their service workers are relatively highly paid and are in such demand that they do not have to worry about their wages being held down by firms seeking government work which, they said, is only a minimal part of their business anyway. They

also said the regulation would ruin their merit pay systems and force them to refuse government contracts.

The government's procurement agency, the General Services Administration, agreed with that assessment and backed the exemption, claiming the law would hurt agencies' ability to procure equipment maintenance and repair. The U.S. General Accounting Office of Congress also said the exemption, opposed by organized labor groups, should be granted for this category of service work.

In its final rule, published late last month, Labor said it had determined

that "wage competition in the [DP service] industry is not a significant factor in obtaining federal contracts."

It said it was granting the exemption because "the affected employees are relatively highly paid pursuant to complex merit pay systems and because the nature of the industry . . . is such that price competition based on labor costs and concomitant wage abuses are unlikely to occur."

Labor also concluded that the exemption is needed "to avoid the serious impairment of government business."

The department ruled that federal contract officers must police compliance with the exemption's conditions and, when approving service agreements, certify that the firms will use the same compensation plan for employees on government and commercial contracts.

Following publication of the exemption, Cbema President Vico Henriques issued a statement hailing Labor's decision. Henriques called the decision "the sensible, cost-saving approach," which has kept the government from "squandering taxpayer dollars through unnecessary regulation."

House OKs Bill; Industry Groups Like Changes

(Continued from Page 151)

export licensing authority from the Commerce Department, which currently has primary authority to license high-technology exports.

Kaufman also said the computer industry was pleased the bill contained a provision for a "comprehensive operating license," authorizing a one-time license for exports of goods and technology between U.S. firms and their foreign subsidiaries, affiliates and licensees. This and other types of multiple export licenses approved in the bill would eliminate burdensome requirements to obtain licenses for individual exports to approved organizations, industry spokesmen said.

The bill also seeks to force the government to reduce or eliminate export controls on items available from foreign sources and to remove controls on items that are routinely approved for export. In addition, licenses for goods containing microprocessors could not be denied solely because of the microprocessor component, but would require a determination that the chip could make "a significant contribution to the military potential" of another country.

The House bill would provide expanded penalties for anyone attempting to export controlled items illegally. Whereas the House amendments would be in force until Sept. 30, 1985, the Senate version calls for a six-year span. Observers here expect a compromise somewhere between the two versions' time frames to be reached before the final bill is ready for the president's signature.

Nobody puts it all together like Zytron.



Our micrographic products are basic to better information systems.

As an industry leader, we've got the expertise and the technical know-how to help you analyze and choose the right micrographic products and services to meet your office information needs.

You get quality products—ranging from microfilm readers and reader-printers, chemistry and film, to

office microfilming and CAR systems—that are pre-tested for reliability and durability.

Plus, Zytron gives you complete service support in purchase and installation. Product availability and on-time delivery are insured through Zytron's national distribution operation—featuring automated order entry, inventory and tracking systems—linking its network of Servicenters across the country.

And, Zytron offers you the option of buying or leasing many of the products you need.

So, you can count on Zytron for cost efficiency and performance. For full-service, and a *full-systems approach* to office information management, turn to Zytron.

Zytron. The intelligent answer.

Zytron

DB a company of
The Dun & Bradstreet Corporation

Executive Office
2200 Sand Hill Road
Menlo Park, California 94025
(415) 854-2306

Call for the Zytron Servicenter nearest you.

Forecasts & Findings

Eight-In. Disk Dead?

The 8-in. floppy disk will ultimately be eliminated from the microcomputer data storage market by the 5¼-in. rigid and floppy disk systems; but the 5¼-in. category, which accounted for 97% of the microcomputer magnetic media market last year, will find its market share declining dramatically as the sub-5-in. Winchester and microfloppy disk systems erode its dominance, according to a study by Creative Strategies International, Inc.

"Mass Storage Media Technology, Evolution and Opportunities" predicts that the 3½-in. hard-jacket disk will take the lead in the microfloppy industry, accounting for as much as 50% to 60% of the U.S. market. Magnetic tape, bubble memory and optical disk markets will grow, but will only play minor roles in the microcomputer storage market through the 1980s, the report declared, predicting that emerging magnetic media technologies will stave off challenges at least until the beginning of the 1990s.

The report is priced at \$1,450 and is available from Creative Strategies International, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

Mainframe, Micro Blitz

Users will show a nearly insatiable demand for processing power over the next five years, and the value of worldwide computer shipments from U.S. suppliers will grow at a compound rate of 17.3% during that time, according to a report released here by International Data Corp. (IDC).

According to "Computer Industry Review and Forecast — 1977-87," personal computers have blitzkrieged the user market and are destined to become the largest computer market of all. The report declares, "In 1981, the value of personal computer shipments to the U.S. market passed those [sic] of terminals; in 1982, small business computers fell; 1983 will leave the minicomputer market behind; and by 1984, the once almighty general-purpose market will succumb."

However, IDC claims that somewhat unnoticed has been a renewed sense of enthusiasm for the mainframe market, especially at the high end, albeit dominated by IBM at the expense of the five noncompatible companies. The minicomputer market will continue to grow at an 18.8% rate over the next five years, as vendors emphasize a single architecture from the desktop computers to the powerful superminis that have increased performance into what was once the mainframe realm.

The 80-page report is available for \$325 from Department M, IDC, 5 Speen St., Framingham, Mass. 01701.

Year of the Desktop

This is the year of the desktop computer, according to "The Professional Computer," a 200-page report in The Technical Office series from The Yankee Group, which reports that worldwide microcomputer sales have increased this year from 1.5 million units to 3.3 million units and from a value of \$5.4 billion to \$10.5

billion.

Of the micros classified by The Yankee Group as desktops, 35% are going into the offices of Fortune 1,000 companies; 37% are purchased by small businesses and independent professionals; 10% are acquired for scientific and engineering use; 5% are bought for educational institutions; 10% are purchased for a mix of applications by elite consumers in the home market; and the remaining 3% are acquired for industrial applications.

The study projects that shipments of desktops will expand at almost a 60% cumulative annual growth rate through 1987, but in North America at only a 40% annual growth rate. Portable computers, however, will

experience growth rates in excess of 100% over the next two or three years, according to the report.

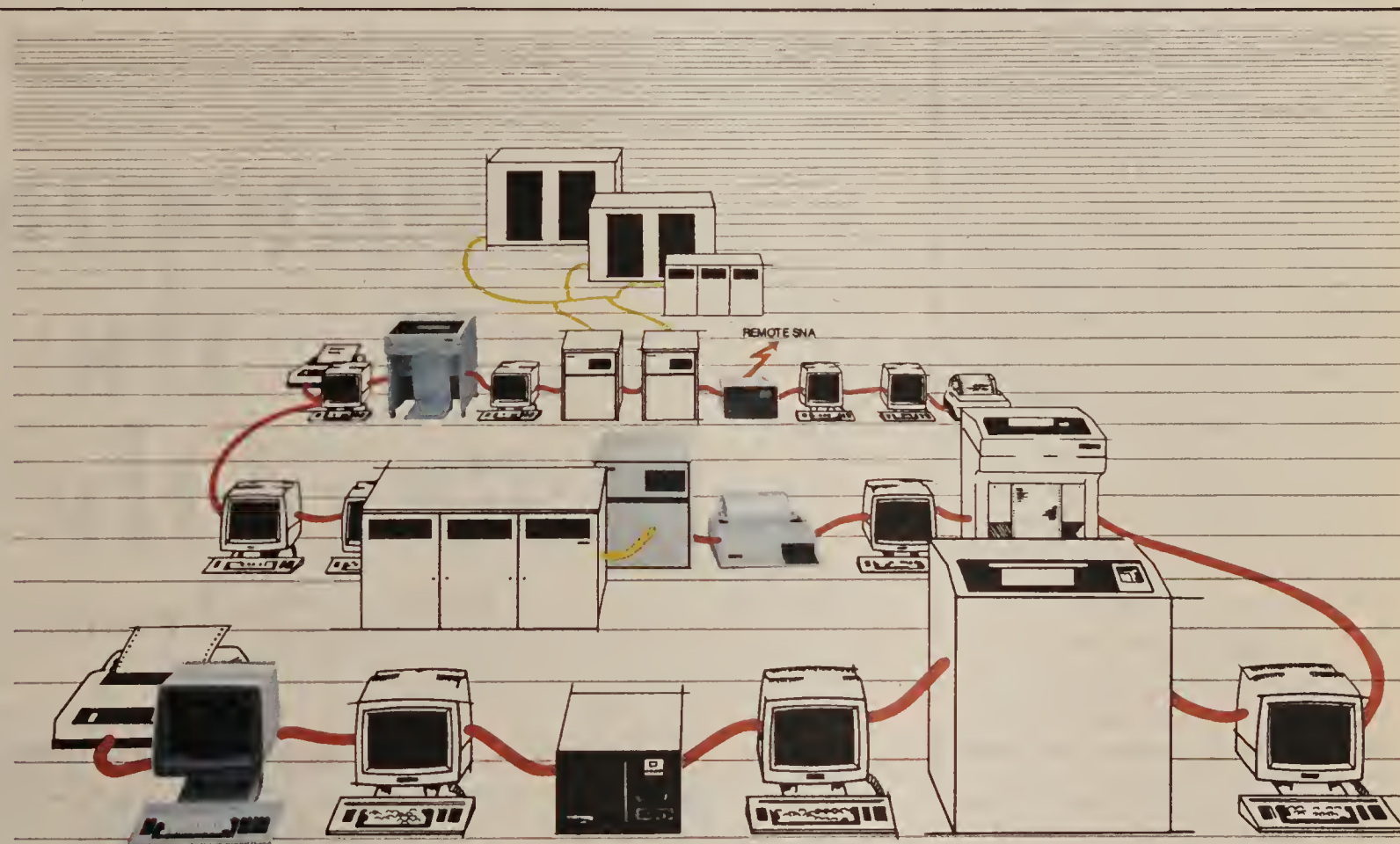
The study is priced at \$950 from The Yankee Group, 89 Broad St., Boston, Mass. 02110.

Floppy Price Dilemma

The single most crucial issue facing floppy disk drive manufacturers today is in offering the most cost-effective product with maximum data capacity in the smallest space; but while higher performance can be achieved, total price becomes a barrier to user acceptance, according to "The Floppy Disk Drive Industry: A Strategic Analysis 1983-1987," recently published by Venture Development Corp.

Prices over \$1,000 have discouraged interest in high-performance disk drives, perhaps because of competition from low-priced hard disks, and the average number of drives per small business computer system will decline from 2.4 units in 1982 to 2.0 units in 1986, according to the report.

The study provides installed base estimates and manufacturer market shares and forecasts shipments in units and current dollars for several product categories in addition to profiling manufacturers and recommending competitive strategies. Priced at \$2,790, the 175-page report is available from Venture Development at 1 Washington St., Wellesley, Mass. 02181.



3270 Networking: No More No Man's LAN.

Imagine. 3270 Processing. IBM-Compatible Personal Computing. Local Area Networking. And SNA Compatibility. In One System.

Imagine a system that successfully settles the uncharted territory of 3270 local networking—that "no man's LAN" of unlinked and unrealized potential.

Imagine a system that delivers the power of 3270 processing, and the flexibility to build two local area networks from a single controller. Imagine being able to attach up to 120 devices to that controller. Or attaching four distinct controllers—and multiple coaxial links of up to 10,000 feet each—to any of those LANs.

Imagine the economies of a system that handles that networking with standard 3270 coax. That requires no commitment to special architectures or non-standard LAN technologies. And that, thanks to a multi-drop, station-to-station design, can eliminate thousands of feet of new coax.

Of course, such a system would have SNA compatibility. But it would also have a set of capabilities to dramatically increase throughput, while reducing hardware and support costs in any environment. Capabilities like multi-host and multi-personality support, application and address switching, and system printing.

This system would have multi-user personal computing "built into" the network—allowing you to

assign true 16-bit computing power, maintain overall MIS control, and share expensive disks and printers.

Such a system would boast an intelligent display station that displays a mastery of ergonomic and aesthetic design. With multi-screen formats, anti-glare screen, low-profile keyboard, and a tilt-and-swivel pedestal with the smallest footprint in the industry. Such a system would also include a full line of printers.

Imagine. 3270 processing. IBM-compatible personal computing. Versatile, economical, powerful local area networking. In one system.

Braegen has imagined just such a system. They have designed it. Built it. And called it the ELAN™ System.

If such a system sparks your imagination, give us a call. We know the feeling. The Braegen Corporation, 525 Los Coches Street, Milpitas, CA 95035, (408) 945-8150; TWX: 910-338-7332.

*Braegen's
Way Works
Better*

BRAEGEN

™ELAN is a trademark of The Braegen Corporation.

Mostek: U.S. Needs to Open Semi Trade With Japan

By Robert Batt

CW West Coast Bureau

SAN JOSE, Calif. — While the semiconductor industry does not employ as many people as some of the older U.S. smokestack businesses, its importance for the entire economy is vital. Semiconductor imports should become more of a priority in Washington, D.C., following last week's visit to Japan by President Reagan, according to a senior industry executive.

The president's trip should underscore needed changes in semiconductor trade between the two nations, according to James Byrne, senior vice-president for business development at Mostek Corp. "If we lose our leadership in this arena, it will have dire consequences for our country," he said in a recent interview. The strategic importance of the semiconductor industry is still not sufficiently understood in Washington, D.C., he added.

That Japan, the world's second strongest economy, is essentially closed to U.S. chip manufacturers should be a cause for concern, he said. "It is important that the problems be discussed at the very highest levels of government," Byrne said. The Mostek executive and seven other top industry officials made a visit to Japan last month in an effort to increase U.S. semiconductor shipments to Japan through the setting up of new, long-term relationships with Japanese equipment manufacturers.

Met With Officials

Those executives, including Robert Noyce, vice-chairman of Intel Corp., and Joseph Boyd, chief executive of Harris Corp., met with representatives from 22 Japanese vendors and suppliers, as well as senior government officials.

"It now appears that a political framework is emerging that allows for the possibility of increasing the U.S. semiconductor presence in Japan," claimed Warren Davis, director of government affairs for the Semiconductor Industry Association (SIA), who also went to Japan.

Davis said sufficient progress has been made by the 18-month-old U.S.-Japan High-Technology Working Group to warrant delaying the threat of U.S. retaliation for what domestic suppliers see as unfair Japanese practices, including government-subsidized cartel policies. The group was born of a joint effort by both countries.

Nevertheless, Davis warned, the patience of U.S. manufacturers is limited. "We would expect to see a significant improvement in the U.S. semiconductor trade with Japan over the next six to 12 months. Currently our market share is 10%, and we will expect to see that climb to 20% to 30% in a fairly short time span," the SIA executive said.

Earlier this year, the SIA prepared a draft petition under Section 301 of the U.S. Trade Act of 1974, alleging that target industry practices in Japan unfairly deny access to U.S. firms and called on the Department of Commerce to exert pressure on the Japanese to open up its markets. The

'It now appears that a political framework is emerging that allows for the possibility of increasing the U.S. semiconductor presence in Japan.' — Warren Davis, director of government affairs for the Semiconductor Industry Association.

SIA decided to postpone submission of the petition to the government because of the apparent progress being made by the High-Technology Working Group.

AT&T Information Systems Inks Pacts With HP, Wang

MORRISTOWN, N.J. — AT&T Information Systems here announced agreements recently with both Hewlett-Packard Co. and Wang Laboratories, Inc. to develop interfaces between the companies' products.

In a prepared statement, AT&T said the agreement covers plans to forge a digital, multiplexed interface linking AT&T's Dimension System 85 voice and data private branch exchange to HP and Wang equipment.

The interface will be made public early next year, AT&T said. As part of the joint agreements, Wang

will license AT&T on its recently announced document communications specifications.

The interface will permit texts written on Wang machinery to be transferred to the AT&T System 85, where it will be converted to electronic document communications format, AT&T said.

Development of the interface between HP and AT&T equipment will involve certification of HP hardware with the System 85. The interface was described in AT&T's statement as a 1.544M bit/sec digital switch, opening up 23 data channels.

Announcing the State of the Smart.

IBM 3270 Personal Computer



Shareholders Approve Harris-Lanier Merger

MELBOURNE, Fla. — Shareholders of Harris Corp. at their annual meeting here recently approved the merger of Lanier Business Products, Inc. into Harris, as did shareholders of Lanier. Also, Harris announced a 16% increase in earnings for the first quarter ended Sept. 30.

The Lanier acquisition, labeled a merger by Harris [CW, Aug. 1], will result in Lanier operating as a subsidiary of Harris. Lanier's chairman, Gene H. Milner, was elected to the Harris board following the annual meeting and will continue to head Lanier.

The arrangement is reportedly valued at about \$275 million, with .525 shares of Harris traded for each of the 15 million shares of Lanier.

Joseph A. Boyd, chairman and chief executive officer of Harris, described the new relationship as "very synergistic."

Harris reportedly intends to use its communications expertise in attempting to link its large systems with Lanier's stand-alone terminals and other office automation products.

Deal Combines Strengths

The deal, Boyd said, "brings together Harris' state-of-the-art technology in information processing, communications and semiconductors and Lanier's outstanding sales, service and distribution capabilities in the office products area. With these combined strengths, Harris now has

a very powerful presence across the total spectrum of the rapidly growing office automation market."

During a New York meeting with security analysts following the announcement of the impending acquisition [CW, Aug. 15], Boyd said Lanier will operate as a relatively autonomous sector of the Harris organization for a year or two.

The quarterly report issued a few days prior to the shareholders' meeting indicated net income for the first quarter of \$14.3 million, or 45 cents per share, in comparison to \$12.3 million, or 39 cents per share reported in the first quarter in 1982, from operations that are presently continuing. It was a drop from total income in the first quarter of 1982 of

\$14.7 million, which reflected \$2.4 million in operations since discontinued.

Sales revenue increase, reflecting the discontinued operations, was \$350 million for the first quarter of this year in comparison to the \$342 million reported one year ago. Boyd said that total orders booked in the first quarter of 1983 increased 26% over a year earlier and exceeded shipments.

STC Ultimacc Acquires Global Software

WALDWICK, N.J. — STC Ultimacc Components, Inc., a division of STC Systems, Inc., recently announced the acquisition of the Raleigh, N.C.-based Global Software, Inc. According to a spokeswoman for STC Ultimacc, the acquisition is valued at \$2 million in cash and \$10 million in notes.

The spokeswoman said the acquisition will enable the STC division to add health care turnkey systems to its line of turnkey systems already serving industries such as lumber, apparel, publications, warehousing and others. Software developed by Global will also enable the STC division to offer plug-compatibility with IBM's Series/36, Series/38 and 4300, according to the spokeswoman.

Global will continue operations as an autonomous business unit with a continuation of its present management team of Ronald Kupferman, president, and Frederick Filger, who will report directly to George J. Pilmanis, president of STC Systems.

The spokeswoman said the acquisition will also enable STC Ultimacc to offer software with its systems at a much lower cost than was previously possible. Previously, the company had paid for third-party software.

The arrangement will provide STC Systems — which had 12 regional offices — with Global offices in Raleigh, Richmond, Va., and Los Angeles, in addition to a 12-member team of international agents.

STC Systems, a wholly owned subsidiary of Storage Technology Corp., is projecting combined revenues of \$25 million.

If you're looking for a personal computer that will satisfy your company's professionals and managers, IBM now has exactly what you need.

The new IBM 3270 Personal Computer.

The fact is, many personal computers can be *too* personal for many business environments. Not the IBM 3270-PC. Its strength is the ease with which it communicates with IBM hosts and office systems — in the next room or around the globe.

The IBM 3270 Personal Computer is designed to accommodate the way people actually work. It can display in color up to seven windows of information at one time. Four with data from host computer applications (on the same or different hosts), two electronic notepads and one IBM Personal Computer session. And despite its impressive capabilities, the IBM 3270-PC is small enough to sit on a desk without taking it over.

The information windows can be moved, just as a person moves papers on a desk. They can be made bigger or smaller, put on top for immediate atten-

tion or temporarily hidden when not in use. Information on the screen can be processed, printed or exchanged between windows. And the IBM 3270-PC can be programmed by the data processing professional to meet the needs of each end user or department.

The IBM 3270 Personal Computer offers outstanding price/performance. And volume discounts are available. It could turn desks throughout your company into very Smart Desks.

To arrange to have an IBM marketing representative contact you, call toll free 1 800 IBM-2468, Extension 90. Or send in the coupon.



IBM			CW11/14
DRM, Dept. BR/90			
400 Parson's Pond Drive			
Franklin Lakes, NJ 07417			
<input type="checkbox"/> Please have an IBM representative call me. <input type="checkbox"/> Please send me more information on the 3270 Personal Computer.			
Name		Title	
Company			
Address			
City	State	Zip	
Phone			

The Smart Desk from IBM.



Adapso Releases Financial Survey

ARLINGTON, Va. — A financial survey of 150 U.S. companies providing various types of computer services was recently released by the Association of Data Processing Service Organizations, Inc. (Adapso).

Adapso's Operating Ratios Survey provides a variety of measures indicating how various entities "stack up against the competition," according to Jerome L. Dreyer, president of the association.

Survey participants are entitled to a report comparing their results to the survey data base. Information is available from Adapso, Suite 300, 1300 N. 17th St., Arlington, Va. 22209.

IBM Seen Poised for Communications Assault

FRAMINGHAM, Mass. — IBM has emerged as a much more potent competitor than the antitrust-bound giant of the late 1970s and is in the process of becoming a very aggressive communications company, according to "IBM, The Giant Awakens," a report published by International Data Corp. (IDC).

With record sales of 3081 computers and 3380 disks, IBM's share of the 1982

'IBM would much rather see its users buy products from others that can fit into an IBM network than have its customers build non-SNA networks to which IBM would provide products as just another vendor.'

— International Data Corp.

mainframe market reached 71%, its highest since the early 1970s, according to IDC. With results expected to be similar in 1983, IDC concludes that IBM appears to be

establishing a new level of high-end dominance.

Big Blue has adopted major philosophical and strategic shifts, the report claims. Historically, IBM has de-

fended its mainframe turf by keeping its 370 architecture proprietary, but has abandoned that approach with the Personal Computer, thus attracting the type of third-party software and peripheral support needed to meet the diverse needs of that market.

From the experience of the Personal Computer, IDC said, IBM has changed its thinking and become more

open to competitors wishing to support its System Network Architecture (SNA) and has published its Document Content and Document Interchange Architecture (DCA/DIA) specifications well in advance of their availability on many products.

"The strategy is clear," according to IDC. "IBM hopes that a combination of its 3270 protocol, SNA and its DCA/DIA formats will allow it to establish the de facto communications standards for the next decade. And as the plug-compatible market continues to grow, the 370 architecture also looms as a strong industry standard."

Control of communications standards is one way of bracing for the upcoming battle with AT&T and others for control of the giant integrated digital networks that will evolve over the next few years and become more important than hardware and peripherals, the report says. "Recognizing that it cannot meet all of its customers' needs, IBM would much rather see its users buy products from others that can fit into an IBM network than have its customers build non-SNA networks to which IBM would provide products as just another vendor," IDC concluded.

More Aggressive Stand

IDC said IBM will become aggressive in the fast-growing, \$100 billion communications market that it previously has not tapped. And the computer giant has shifted from the goal of dominating a few markets to one of participating in the growth of many markets, as evidenced by the establishment of independent business units to enter fast-moving areas such as personal computers and robotics, according to the report.

IDC expects that IBM will now start to concentrate more heavily on mid-range systems to meet the competition from Digital Equipment Corp., Wang Laboratories, Inc. and others, the report said. "DCA/DIA appears to be the giant's way of tying [its variety of products] all together to meet its customers' office automation needs."

The 71-page report contains detailed analysis of IBM's hardware, software and financial strategies, as well as overviews of joint-venture efforts and office and communications positioning, with an emphasis on the implications for competitors. Priced at \$295, it is available from Department MT, International Data Corp., 5 Speen St., Box 955, Framingham, Mass. 01701.

Your IBM PC's Freeway to the Future

3270 Coax

Micro-mainframe link

SPEED UP 2.35 Mb.

Your IBM Personal Computer — or PC-XT — can access your IBM mainframe's data base and accomplish file transfers through existing 3270 coaxial network. Easily. Inexpensively. There's a family of Forte products for the micro-mainframe link. Plug a Forte board into an expansion slot in your IBM PC — remote or channel attached and linked via BSC or SNA/SDLC — and you've put your PC on-line with your host via coax. To the host, your PC is a 3278/3279 terminal, but functionally you have standalone computing power in a high-performance intelligent workstation.

Forte products for the micro-mainframe link are totally soft-loaded, and enhancements will be diskette-based. Such Forte upgrades as new terminal emulations and custom file transfers will be on diskette, so your investment today is protected. Right now, Forte products provide such delights as switch-selectable address selection, field-configurability of PC elements such as keyboard changes, program symbols, full-color graphics, menu-selected file transfers, and access of full-screen host applications. There's lots more, too, including parity and remote dial-up of the host via coax. All the reasons for a micro-mainframe connection for your business are compelling today. They'll be essential tomorrow. We can help you put your IBM Personal Computers on the Freeway to the Future now. Ask about it. That's our Forte.

FORTE™

FORTE DATA SYSTEMS

FORTE DATA SYSTEMS • 1500 Norman Ave. • Santa Clara, CA 95050 • Phone (800) 233-3278

In Calif. (408) 980-1750

Forte is a trademark of Forte Data Systems.
IBM, IBM PC-XT and IBM Personal Computer are trademarks of IBM Corporation.

© Forte Data Systems 1983

VAX track to hardware freedom.

You know about the many portable programming benefits of UNIX™. You're also keenly aware of your company's extensive investment in VMS software. Now you can take advantage of both and be hardware independent, too. Because now there's EUNICE.

▲ Clearly, the way to go.

EUNICE provides a machine transparent medium that allows your programmers the freedom to operate in any one of three environments: VMS, UNIX, or integrated VMS/UNIX. They can switch modes at any time, depending on application. And through EUNICE, they can also take advantage of a wealth of available UNIX-based software.

EUNICE comes with the full Berkeley 4.1 BSD UNIX environment which includes the high level languages of C, FORTRAN 77, LISP, Pascal, and Franz LISP. You also get standard UNIX networking software. Plus, Source Code Control System — a powerful facility that provides a completely controlled program development and documentation environment.

▲ We keep you on track.

Wollongong is a full-service organization

dedicated to the advancement of UNIX. As such, we're quickly becoming recognized as *The UNIX Authority*. We sell more UNIX-based software to the 32-bit minicomputer market than anyone else. And back it with the widest range of support services available.

Services like personalized client consultation; system-level design; fast, efficient installation; on-site training and full documentation. We also provide a wide variety of options to enhance the efficiency of your VMS/UNIX system. Options like RM/COBOL, a high-level implementation of the ANSI 74 COBOL standard for efficient execution of COBOL business applications. Or IP/TCP, the new Department of Defense protocol that allows two or more host computers to communicate within a pre-defined environment.

▲ Over 300 VAX sites already free!

They know the fastest track to independence lies with EUNICE. Because they've joined the growing list of satisfied Wollongong customers. To find out how you can enjoy hardware freedom, mail the coupon today, or call our toll-free number: 800-USA-UNIX. In California, call: 800-962-UNIX.

CW11/14/83

The Wollongong Group, Inc.
1135A San Antonio Road
Palo Alto, CA 94303
Tel 415-962-9224

OK, I'm ready to declare my hardware independence. Please send me all the details.

Name _____

Title _____

Company _____

Address _____

City _____

State _____ Zip _____

Phone (____) _____

TMUNIX is a trademark of
Bell Laboratories.

WOLLONGONG
The UNIX Authority

DEC Announces VAX Software Marketing Pacts

MAYNARD, Mass. — Digital Equipment Corp. recently announced three cooperative marketing agreements for manufacturing- and process-related software that will be marketed with the VAX series of superminicomputers.

Agreements for DEC to promote and market software products were reached with Consilium Associates of Palo Alto, Calif.; NCA Corp.

of Sunnyvale, Calif.; and Rath & Strong System Products, Inc. (RSSP) of Dallas.

Consilium's Comprehensive On-Line Manufacturing and Engineering Tracking System is an 11-module computer-aided manufacturing software package that reportedly is used primarily in semiconductor manufacturing. Written in Ansi Cobol and utilizing standard VAX architecture and layered soft-

ware, the modules range in price from \$25,000 to \$150,000 and are available 30 days after receipt of order.

NCA Corp.'s Maxcim product is a 14-module package with an integrated common data base designed as a manufacturing and financial planning and control system to provide information required for planning, reporting and control of manufacturing resources; the system

integrates information from manufacturing, marketing, finance and engineering functions. Originally developed for the PDP-11 series, the VAX version can be configured on VAX-11/750, 11/780 and 11/782 systems. Prices range from \$60,000 up to the complete package cost of \$113,000, and delivery is 30 days after receipt of order.

The Production and Inventory Optimization Sys-

tem from RSSP is an eight-module closed-loop package reportedly providing master production scheduling, purchasing management, shop-floor control, inventory control, customer order entry, materials requirement planning, bill of materials and cost management. Written in Ansi Cobol, modules are priced from \$10,000 to \$25,000 individually, with versions for single-plant and multiple-plant operations available for \$100,000 and \$250,000 respectively.

More information is available from DEC, Maynard, Mass. 01754.

Fujitsu Nets 21% Increase In Income

TOKYO — Fujitsu Ltd. recently reported net income of \$81.5 million for the six-month fiscal period ending Sept. 30, nearly a 21% increase over the corresponding period in 1982, when earnings were \$67.5 million.

Net sales for the six-month period rose 20% to \$1.9 billion, compared with \$1.56 billion in the same period the previous year.

Fujitsu reported a decline of 1.4% in sales of communications systems, but healthy increases of 20.5% for computers and DP equipment and 42.4% for electronic components. Export revenues increased 18.3%.

The Japanese company predicted that net sales for the fiscal year ending next March 31 will reach \$4 billion, and earnings will be \$186 million, compared with earnings reported for the fiscal year ended this past March of \$159 million on sales of \$3.42 billion.

Comdex Set For Japan

NEEDHAM, Mass. — The Interface Group, Inc. has announced that its series of Computer Dealer Exposition (Comdex) conferences for the computer industry will extend to Asia with the premiere of "Comdex in Japan" in spring 1985.

The conference will be sponsored by the Interface Group and the Comdex in Japan Executive Committee, a joint venture partnership comprising two Asian firms — International Congress Service, Inc. and Information International, Inc.

More information is available from the Interface Group, 300 First Ave., Needham, Mass. 02194.

WHICH TWIN HAS THE TANDBERG?

The big screen terminal that's soooooo easy on the eyes

If your operators are getting eye-strain and headaches from staring at small, fuzzy screens all day long, chances are, you haven't yet heard of the Tandberg Data TDV 2200.

The TDV 2200 features a 15-inch screen with big, flicker-free, green-on-green characters; a patented Equalite™ Video system that displays both vertical and horizontal lines with equal intensity; and true character definition across the entire 15-inch screen. The TDV 2200 also tilts, swivels, raises and lowers for easy readability in any room light, at any angle.

But there's a lot more to the TDV 2200 than meets the eye. There are sixteen soft switches called PUSH keys that recall previously stored words, phrases, or code sequences. A single keystroke can recall up to 48

characters. This not only saves time, but also eliminates the possibility of error when entering this data. Up to 416 characters can be stored and recalled from the terminal or host computer.

There's also a simplified menu protocol that cuts set-up time in half; full editing capability; up to eight screens of memory; semi-graphic display; character, page, block or line/field transmission and a host of other features.

The Tandberg Data TDV 2200 family is available in a number of models that will emulate virtually any popular terminal including the DEC VT100 and VT52, Data-point 3600 and 8200, IBM 3101,

TANDBERG DATA
Tandberg Data, Inc.

Data General 6053 and D200, H-P 2622, Basic Four and others. An advanced performance model is also available for the development of application-tailored OEM terminals.

To truly appreciate this outstanding combination of graceful ergonomic design, functional capabilities and performance features, you should really try one for yourself. Just call or write for a demonstration. You'll see that there's a lot more to the TDV 2200 than meets the eye. Tandberg Data, Inc., P.O. Box 99, Labriola Court, Armonk, N.Y. 10504. Phone: (914) 273-6400. Telex: 137357 Tanberg Arnk.

See Us At Comdex - Booth #1676



A unique company dedicated to the development and enhancement of UNIX* software and support regardless of host hardware! This was the concept pioneered by The Wollongong Group in 1980. The year it introduced the 32-bit UNIX-based operating system for the Perkin-Elmer 3200 Series.

The world's first UNIX utility company.

Since then, we have continued to develop and market a wide spectrum of UNIX software for 32-bit minicomputers. We have also gained an enviable clientele from the ranks of the 'Fortune 1000.' In fact, we have now extended the UNIX utility concept through distribution channels to worldwide markets.

Today, Wollongong software products not only operate under UNIX, but also under DEC's VMS and our proprietary EUNICE which provides a transparent link between UNIX and VMS on the same host computer.

System-level packages

These run under VMS or EUNICE for VAX users, or UNIX for PE 3200 users.

IP/TCP Internet Protocol Transmission Control Protocol is the newly adopted Department of Defense standard which provides a set of cooperative processes allowing two or more host computers to communicate.

R/M COBOL is a high-level implementation of the ANSI 74 COBOL standard, designed for efficient development and execution of COBOL business applications. Features include GSA certified COBOL, Level-2 relative and indexed file access methods, plus full arithmetic capability.

Full Screen Editor supports advanced programming and text processing requirements, concurrent file editing, and formatting.

Metaport products

EUNICE A comprehensive suite of software which provides VAX users with the unique ability to merge their native VMS environment with state of the art UNIX commands and utilities.

REX Runtime EXecutive provides all necessary interface software to allow application-level programs developed under UNIX to properly execute with VMS.

UNIX support services

Comprehensive seminars are provided for both novice and experienced UNIX users. These feature hands-on lab sessions as well as classroom presentations. Yearly support contracts which extend all the services and support provided during the initial product warranty period are also available.

Custom products and services

These include UNIX 'porting', UNIX modifications for special applications, custom hardware/software integration and system performance analysis.

Plug-in now to the world's first UNIX utility company for total service and support. From The Wollongong Group, 1135a San Antonio Rd., Palo Alto, CA 94303. Telephone 415-962-9224. Toll free 800-USA-UNIX (In California call 800-962-UNIX).

WOLLONGONG

*UNIX is a trademark of Bell Laboratories

Micros Seen Redefining Value-Added Mart

By Peter Bartolik
CW Staff

FRAMINGHAM, Mass. — The rush of microprocessor-based hardware and software in commercial markets is redefining the boundaries of virtually all traditional computing markets and has critical implications for value-added suppliers, according to a report by International Data Corp (IDC).

"Hardware Strategies of Value-Added Vendors," a 53-page report by IDC's Continuous Information Ser-

vices, concludes that the rationale for larger system computing's monopoly in commercial markets is fading rapidly as computer processing and storage prices radically decline. The result, according to the study, is that value-added suppliers — providers of processing and professional services, independent software firms and OEM/system houses — face rapid changes in the traditional markets.

"New hardware technology and architecture are critically important in the breakthrough to significant

new end-user markets, but just as important is the software that makes the machines work the way users need them to," the report said.

Prior to the micro breakthrough, IDC said, "the software industry was a veritable Tower of Babel [with] many languages and syntaxes used by enclaves that could not communicate with each other — all to protect the hardware manufacturers' installed base from incursions by competitors."

Micro manufacturers, however,

have relied on a handful of operating systems that have become de facto standards, resulting in a large number of applications packages "allowing users instant access to large libraries of software for their newly purchased micros," IDC said.

Processing services, both data base providers and time-sharing companies, increasingly see microcomputer offerings as important to their survival and "to prevent further erosion of their traditional business."

(Continued on Page 168)

LIMITED
TIME OFFER!

GET THE SINGLE MOST IMPORTANT PERIPHERAL FOR YOUR IBM PC AND COMPATIBLES AND SAVE 47%!

PC WORLD

PC WORLD IS MUCH MORE THAN A MAGAZINE.

PC World is the single most important peripheral for your IBM Personal Computer and Compatibles.

The world of the personal computer is expanding every day. Hardware and software makers are working "around the clock," developing new products to expand the capabilities of your PC. Each month PC World's own experts report to you what's new in this growing world. At last, you have an independent and authoritative source of information to help you get more of everything you need and want from your PC.

What's more, PC World is written in a fresh and lively style—with a minimum of technical jargon. PC World gives you what you need most—straightforward information you can rely on—before you spend your money on other necessary peripherals.

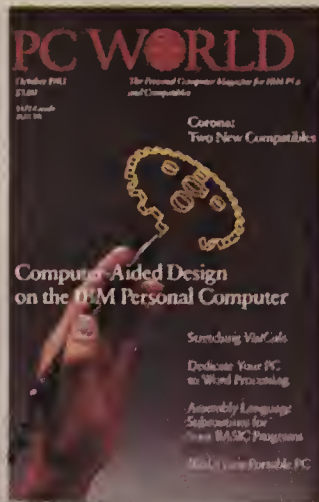
If you're not reading PC World, you're not getting the most out of your personal computer.

THE PERSONAL COMPUTER WORLD OF TOMORROW IS BEING CHARTED IN THE PAGES OF PC WORLD TODAY.

PC World will keep you up to date on the state of the art in areas such as local networks, telecommunications, and data bases. We'll bring you impartial, reliable reports on the fast-growing body of second-generation software being developed especially for the IBM PC and Compatibles—all with a level of editorial excellence you simply won't find in any other magazine.

SPECIAL ISSUES YOU WON'T WANT TO MISS: THE PC WORLD HARDWARE AND SOFTWARE REVIEWS.

Take advantage of PC World's limited time offer and you'll receive two special



issues—the PC World HARDWARE and SOFTWARE REVIEWS. These issues will include everything you need to make purchasing decisions that are right for you: specs, sources of supply, prices, performance data, comparisons, and much, much more.

This is a limited-time offer. Subscribe immediately before December 31, 1983, to get 12 regular issues of PC World plus the two special issues for a total of 14 issues—all for only \$24. Act now and you'll save 47% off the regular newsstand price.

EXPAND YOUR WORLD!

PC World will help you expand your own world as we explore the vast potential of the personal computer.

Together—PC World and its readers—will advance the state of the art by sharing their discoveries and experiences.

To expand your world, order your subscription to PC World now during this special offer.

PC WORLD'S NO-RISK GUARANTEE:

We're absolutely certain that once you've come to rely on PC World you won't want to miss a single issue. That's why we can make this no-risk guarantee: If, within the first 90 days of beginning your subscription to PC World, you are not completely satisfied, just write us of your intention to cancel and we'll REFUND 100% of your subscription price.

WITH NEW ADVANCE- MENTS EVERY DAY, YOU NEED PC WORLD EVERY MONTH.

Mail the coupon below today OR call TOLL-FREE: 800-247-5470 (From Iowa: 800-532-1272).

PC WORLD

☐ I ACCEPT! Please enroll me as a PC World subscriber for 14 issues at \$24.

☐ Bill Me ☐ Payment Enclosed ☐ Charge to my ☐ VISA ☐ MasterCard

Account # _____ Interbank # _____

Expiration date _____ Signature _____

All subscriptions begin with the next available issue. Please allow 6-8 weeks for delivery of your first issue. Outside the U.S., subscriptions must be prepaid in U.S. funds. For foreign surface mail add \$24 per year to the subscription rates; for foreign airmail add \$101 per year to the subscription rates. Allow an additional 4 weeks for delivery by foreign surface mail.

NAME _____

COMPANY _____

ADDRESS _____

CITY, STATE, ZIP _____

Mail to: PC World, Subscription Dept., P.O. Box 6700, Bergenfield, NJ 07621.

EXPAND YOUR
WORLD!

Executive Corner

● **Richard P. Abraham** has been appointed president of Synertek, Inc., a Honeywell, Inc. subsidiary.

● **Jerry Thorp** has been named president and chief operating officer of Solutions Group, Inc.

● **Paula J. Brooks** has joined Infodata Systems, Inc. as vice-president, marketing.

● **Andrew C. Knowles** has been named president and chief executive officer at Lexidata Corp., replacing **Ralph T. Linsalata**, who will remain a member of the board of directors.

● **Donald L. Waite** has been appointed vice-president of finance and chief financial officer at Seagate Technology, Inc.

● **Anthony L. Craig** has been appointed vice-president, international sales integration, at General Electric Information Services Co.

● **Mornay R. Mahoney** has been appointed vice-president in charge of European operations for Storage Technology Corp.

● **Cal Shoemaker** has been named vice-president for sales and marketing at Timplex, Inc.

● **Ramam M. Patel** has been promoted to vice-president, channel products and special engineering, in Harris Corp.'s Interactive Products Division.

● **Charles M. Brennan III**, senior vice-president and chief financial officer at Gould, Inc., has been named a director of the company. **Dr. Joseph E. Rowe** has been elected vice-chairman and chief financial officer and **Henry J. Peppers** has been elected executive vice-president of defense systems, business section.

● **Richard E. Pigman** has joined Associates Bancorp, Inc. as senior vice-president of information technical services.

● **Charles P. Reilly** has been appointed senior vice-president of marketing, sales and service at Centronics Data Computer Corp.

● **Dean Witter III** has been appointed corporate treasurer at Amdahl Corp.

● **William J. Razzouk** has been named vice-president, sales, and **James R. Vaughan** has been named vice-president, service, for Federal Express Corp.'s Electronic Products Division.

● **Ron G. Stegall** has been promoted to senior vice-president, computer marketing, at Tandy Corp.

● **Bert J. Novak** has been elected an officer of Tymshare, Inc. and named group vice-president of computer management services.

● **Jim Ortman** has been promoted to senior vice-president of sales at Phillips

Information Systems, Inc.

● **David K. Anderson** has been promoted to vice-president and legal counsel for the computer systems operations of Sperry Corp.

● **Wallace A. Cataldo** has been promoted to chief financial officer for Keane, Inc.

● **George W. Sullivan** has been appointed president and **Charles M.H. Shiu** has been appointed vice-presi-

dent, business development, at Northern Telecom International, Inc.

● **Charles Babbitt** has been appointed executive vice-president and chief operating officer at Ashton-Tate.

● **Robert L. Dahlberg** has been named by Otrona Computer Corp. of Boulder, Colo., as director of manufacturing. He was formerly director of material for Harris

Corp. in Dallas.

● **David J. Packwood** has been named president of Altergo Products, Inc. Packwood was previously sales director for Software Sciences, which purchased Altergo in April.

● **John J. Theiss** has been named president and general manager of Cardkey Systems, Inc., a Fairchild Industries, Inc. company.

● **David R. Earl** has

joined Pixel Computer, Inc. as vice-president of manufacturing, the same position he held for four years at Data Terminal Systems, Inc.

● **Walter J. Eissmann** has been appointed vice-president of Tymshare, Inc.'s national accounts division. A Tymshare vice-president for four years, he most recently served as general manager of the office automation division.



Introducing InterTest[®] 2.3

Over 1200 users know that InterTest[®] raises CICS productivity by simplifying testing and debugging. Now InterTest 2.3 has features that push productivity even higher than before.

Easier to use

InterTest release 2.3 really flies with a menu-driven format. So new users can become more productive right away. A HELP facility and new documentation make InterTest easier than ever to install, learn, and use.

More powerful

InterTest 2.3 includes powerful new tools that simplify and speed up

CICS testing. Conditional breakpoints let you define conditions that will stop program execution, such as a program variable changing its value. COBOL source code is now displayed online, so you don't have to wait for printed listings. Limits can be set on the amount of main storage or the number of CICS requests that a program is allowed to issue. With InterTest 2.3, your CICS productivity and reliability will really soar.

Continuous support keeps you flying high

On-Line Software is fully committed to InterTest support and development. We've taken the product through nine releases of CICS, and continuously added new features. And all InterTest users automatically get new release tapes, so you're never left behind.

Take a test flight

You can try InterTest 2.3 for 30 days at no charge. If it doesn't live up to your expectations, just return it.

Join over 1,200 users who are convinced that for CICS testing, InterTest is the only way to fly! Just send the coupon or call us toll free (800) 526-0272.

- ☐ Send me the forms for my 30-day trial of InterTest 2.3.
- ☐ I need more information:
 - ☐ Call me ☐ Send literature
 - ☐ Send Videotape: ☐ VHS ☐ Beta ☐ 3/4"

Name _____

Title _____ Phone _____

Company _____

Address _____

City _____ State _____ Zip _____

ON-LINE SOFTWARE INTERNATIONAL

Fort Lee Executive Park, Two Executive Dr.
Fort Lee, NJ 07024 (201) 592-0009
Toll Free (800) 526-0272

CWISN3

Motorola Exec Sees Semi Industry Boom in '84

By Robert Batt

CW West Coast Bureau

PHOENIX — A booming semiconductor industry for the rest of this year and a record-breaking 1984 were the prospects held out to industry observers here at a recent technical briefing by Motorola, Inc.

In an upbeat assessment of his company's prospects, Chuck Thompson, vice-president and director of marketing at Motorola Semiconductor Products Sector, said Motorola, the No. 2 chip manufacturer, will experience a compound growth rate in chip sales exceeding 20% this year.

Thompson noted that third-quarter results just released show revenues up by 30% compared with the equivalent period last year. Year-to-

date billings (September 1982-September 1983), he said, showed major increases in all of Motorola's product areas, with metallic oxide semiconductor (MOS) products growing by nearly 39%, discrete devices up by 28% and bipolar products increasing by 17%.

The automotive industry, he added, has been the most hungry consumer sector for the company's products, with demand in that sector up 45%, followed by communications equipment, up 38%, and computers, up 17%.

Thompson claimed total integrated circuit industry sales will double over the next five years from the current \$17.4 billion to \$37.7 billion in 1988.

"The business outlook is positive, demand for semiconductor products is strong and the key to future growth lies in developing new products," added Jim Fiebiger, assistant general manager of the semiconductor products sector.

Fiebiger claimed the company will see a 22% compound growth rate in its bipolar products sector over the next five years, compared with an industry growth average of 15%.

The introduction of the Motorola 68000 chip into the IBM Personal Computer XT/370 model will give sales a boost, he predicted, with 1983 shipments of the 68000 expected to be five times as large as 1982 levels. Fault-tolerant computing, word processing systems, executive worksta-

tions and other office automation equipment are responsible for the increase in demand, he explained.

In the memory area, the company predicted that MOS memory products will be the fastest growing segment ever in the history of the semiconductor industry, with industry levels climbing from a 1980 level of \$2.2 billion to \$32 billion by the end of the decade.

According to Peter Bagnall, Motorola's director of memory operations, 1984 will also see a continuing acceleration of dynamic random-access memory (RAM) shipments, with volumes reaching 750 million units compared with 350 million this year. Bagnall estimated Motorola's share of the market at 10%, and he also confirmed that Motorola expects to unveil a 256K-byte dynamic RAM in the spring of 1984. The product has been under development for the last three years, he added.

Despite the rosy picture painted by Motorola officials, some gaps in the company's performance were noted. For example, while the company has achieved the status of No. 1 semiconductor supplier in the U.S., it continues to trail Texas Instruments, Inc. worldwide.

The Japanese market in particular, the world's second-largest chip market, is grossly underdeveloped, accounting for only 3% of the company's business, compared with 68% for the U.S., 19% for Europe and 10% throughout the rest of the world.

SPECIAL LEASING OFFER
\$75/MONTH
(Limited time, includes on-site service)

NO OTHER BURROUGHS EMULATOR CAN MEET OUR "STANDARDS"

Data Access Systems, Inc. is proud to introduce the Visual 383 from Visual Technology, the latest in state-of-the-art Burroughs TD830 emulation.

We selected the Visual 383 because of its exceptional features compatible with Burroughs TD830 escape codes.

Features. Visual incorporated the tilt and

They approached programmability with the same high standards. Other emulators offer you 6 or 7 programmable function keys, the Visual 383 has 16. In fact the ENTIRE keyboard can be reconfigured to meet your exact needs with all soft keys and configured screens password protected. Plus you can store up to 350+ bytes in non-volatile memory.

And designing special applications is a lot easier with the Visual 383 because the internal buffers for screen, data communications, soft keys, printer ports and local forms can be modified according to YOUR requirements.

Data communications—how could it be made faster when complex screen formats have to be repeatedly transmitted from the host? Easy, just download user screens to the terminal's forms memory for fast recall, at any time. The Visual 383 supports all standard Burroughs data communications modes including poll, select, fast select, group poll, group select, broadcast select and contention modes.

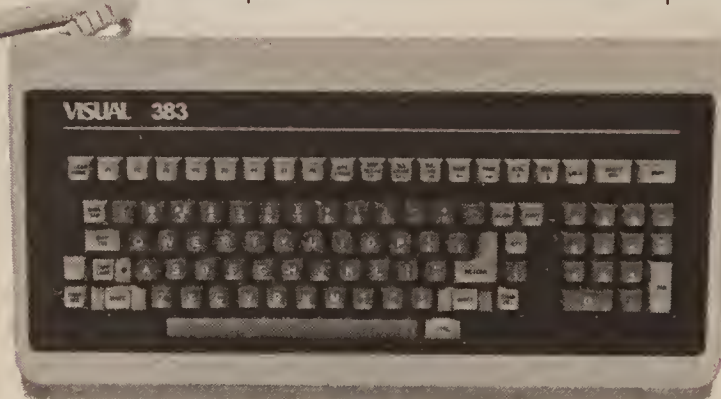
The Visual 383 line monitor mode enables you to quickly identify communications and system problems. You can assign one of the 6 standard pages of user memory to the 'line monitor page' for greater analysis capabilities.

It even supports two different polling stations so data entry and printing can take place concurrently. And the separately polled printer port supports both XON/XOFF and PRINTER/BUSY allowing you to use ANY serial RS232 printer.

Support. But the best system design in the world is only as good as the service and personal attention supporting it. At DASI we provide customized system support and fast response to your service needs—on-site, return-to-depot or board swap, from our 22 locations across the country. Our flexible financing, lease and rental programs help you keep within your budget plans.

Price. You usually get what you pay for. But with the Visual 383 you get a lot more. More features, more flexibility, AND more support.

The Visual 383 is compatible with the Visual 420, Burroughs SR100 and SR110.



swivel design for more operating comfort and increased the green P31 phosphor screen to 14" for better clarity of its 9 x 7 character formation.

But looks aren't everything. What's inside puts the Visual 383 way ahead of the competition...

The selectric typewriter style keyboard with n-key rollover and sculptured keycaps has been engineered with 'capacitive-scan' technology.

FEATURES	VISUAL VS 383	DATAMAXX MAXXIMA 983	DELTA DATA 2830H	BURROUGHS SR110	BEEHIVE DM83
Screen Type	14" Green P-31	12" Green P-31	12" Green P-31	12" White P-4	12" Green P-42
No. of Pages Standard	6*	2	2	5*	4*
Password Protected Set-Up Functions	6	3	None	None	1
XON/XOFF Printer Support	STD	NO	NO	NO	STD
Host Accessible Local Forms Storage Buffer	STD	NO	NO	NO	NO
Function Key Storage	Non-Volatile RAM with Battery Back-up	Non-Volatile RAM with Battery Back-up	—	Non-Volatile RAM	Non-Volatile RAM
Completely Reconfigurable Keyboard	STD	NO	NO	STD	NO
User Configurable Page, Data Comm, Softkey Buffers	STD	NO	NO	STD	STD
Time of Day Clock	STD	STD	NO	NO	STD

*VARIABLE PAGE BUFFER (with adequate Data Comm, soft key and printer buffer)
Products Comparison as of May 1983



DATA ACCESS SYSTEMS, INC.

Coles Road & Camden Ave.
PO Box 1230 Blackwood, NJ 08012
(609) 228-0700 • (800) 257-7748 • in New Jersey (800) 232-6510

District Offices:
Atlanta (404) 449-5436 • Boston (617) 769-6420 • Chicago (312) 967-0440 • Cleveland (216) 473-2131 • Dallas (214) 263-0252 • Denver (303) 337-4103
Houston (713) 682-5965 • Los Angeles (213) 532-2238 • Minneapolis (612) 854-4466 • New Jersey (201) 227-8880 • New York City (212) 564-9301
Philadelphia (609) 228-6660 • Phoenix (602) 254-1927 • San Francisco (415) 872-1811 • Seattle (206) 575-1448 • Washington, DC (301) 459-3377.



Return the coupon or call us for an on-site demonstration. Then compare the Visual 383 to the competition. You'll see why it offers you more than any other emulator available today. Return to: DAS

Coles & Camden Ave.
PO Box 1230 Blackwood, NJ 08012

NAME _____ TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
TELEPHONE _____

Dealer Inquiries Invited

Study Details Micro Impact On Remarketers

(Continued from Page 166)

Hardware strategies of processing service providers "add up most often to micro software strategies" as micros bring information processing capabilities to "vast new realms of heretofore unreachable users" and change the habits of experienced users, IDC concluded.

Similarly, the success of the personal computer is reshaping the packaged software marketplace and opening up a mass market to software firms. "The hardware strategies of the packaged software suppliers revolve around capturing as much share of this new market as possible with new software products, or newly refurbished software products, that successfully piggyback on those microcomputers which are bought in large numbers by first-time and old-time computer users alike."

IDC predicts that retail software sales will become increasingly important with more large users turning to retail outlets for both hardware and software. IDC also said the line between types of software products is blurring as suppliers cross over into previously distinct areas. Very much in question is whether micro proliferation will spur infinite growth for independent software operations, or if a few large organizations — hardware firms, traditional print publishing companies, data communications networkers and processing services — will dominate.

Micro Software Mart Competition Seen Intense

By Bohdan O. Szuprowicz
Special to CW

Early last month, Lotus Development Corp. became the first of the new breed of micro software companies to go public. Its immediate performance in the aftermarket augurs well for a group of leading microcomputer software firms that are expected to go public in the months ahead. Lotus came to market with 2.6 million shares at \$18 each, which rose to over \$27 per share in recent trading.

The overall market for micro software is estimated at \$2.1 billion and expected to increase rapidly to almost \$12 billion by 1988. There appears to be much room for growth and profits for entrepreneurs and investors alike.

But these statistics may be deceptive because, unlike hardware manufacturing, just about anyone with a microcomputer can get into the micro software business; the competition in this game is probably more intense than in any other high-technology sector.

In mid-1983 there were at least 5,000 micro software products on the market, supplied by about 200 manufacturers. That, however, accounts for only the most visible and best financed suppliers. An executive at a recent meeting of the Association of Data Processing Service Organizations, Inc. (Adapso) said his company started a count of micro software firms in North America, giving up after reaching 11,000, with no end in sight.

Few and Far Between
This means the average revenues of a micro software firm are but a few hundred thousand dollars per year; while the industry is booming, individual firms with prospects of rapid and profitable growth to become micro software giants are few and far between.

A recent Adapso study also revealed that average revenues per employee in a micro software firm are just over \$53,000, about half that of employees at mainframe and minicomputer software companies. At the same time, micro software firms spent almost 50% of their revenue on salaries and are constantly scrambling to find new talent as their employees move to better paying jobs with competitors or start their own micro software businesses.

A recent survey identified 25 software companies whose revenues grew by over 50% during 1982. Among those firms, there were eight companies growing at over 100%, and five of those were new micro soft-

ware firms such as Softsel Computer Products, Inc.; Micropro International Corp.; Ashton-Tate; Digital Research, Inc.; and Microsoft, Inc.

Ashton-Tate specializes in cross-industry micro software, and its relational data base management system is the third-best selling package after Visicorp's Visicalc and Lotus 1-2-3, which gave Lotus its leading edge in this

market.

But the leader of the pack with an impressive growth in revenues of 353% during 1981-82 is Softsel, the largest independent distributor of micro software packages, which expects to double its revenues to about \$70 million in 1983. The company also received at least \$11 million in venture capital and looks like a prime prospect for going public very soon.

Only extensive teledelivery of software directly from producer to end user threatens its future.

Micropro turned up as the second-fastest growing micro software company, whose revenues rose by 336% from \$9 million in 1981 to over \$39 million in 1982 and are expected to reach \$50 million in fiscal 1983. Micropro produces the Wordstar word processing package.

Digital Research, owner of CP/M, posted revenue growth of almost 160%, to \$22 million in 1982, and the company expects to reach between \$30 million and \$40 million in fiscal 1983.

Microsoft, also competing in the operating micro software business, has been growing at about 120% per year recently and expects to double again to about \$50 million in fiscal 1983.

We opened this quality disc to show how it stands up and performs. On the surface, flexible discs look alike. But if you inspect them closely, Memorex® sets itself apart.

The cross-linked oxide coating is unique. It results in a coating that will hold a stronger signal for greater recording and playback accuracy. Each disc is burnished to an ultra-smooth surface to reduce head wear and extend media life. A protective hub ring on mini discs eliminates edge damage to the drive access opening resulting in better alignment and dependable performance.

For durability, we constructed a disc jacket from extra-stiff vinyl that loads easier. Glue-sealed to prevent intermittent bonding and stress-notched for added protection, discs withstand the rigors of everyday usage better.

We added a self-cleaning jacket liner that cleans and removes debris from the disc while in use. The result is top performance throughout a long disc life.

You can trust Memorex flexible discs. You know they're reliable because we individually certify every one to be 100% error free.

For any application—5¼" or 8," one side or two, single or double density—look to Memorex Flexible discs. For more information, call (800) 222-1150; in California call collect (408) 987-1893 or your local distributor today.



MEMOREX
A Burroughs Company

See us at Comdex, Booth #1236

POSITION ANNOUNCEMENTS

Engineers/Systems Analysts

CSC Call to Opportunity

When you're with a leader, there are no limits. At Computer Sciences Corporation, the proof is in our opportunities. Innovators in the information sciences industry, CSC has the experience, the technical capability, the contracts and the stimulating, supportive environment to take your career farther... faster!

CSC's Defense Systems Division has supplied the military with technological breakthroughs in airborne, shipboard and ground support tactical and strategic command and control systems. Our Defense Systems Division's AEGIS Weapons System Program, based in Moorestown, NJ and Dahlgren, VA, uses the latest advances in computer telemetry radar and data acquisition to help create the world's most advanced shipboard decision-making combat system. At our Logistics Center of Excellence in Dayton, OH, you'll play a key role in determining objectives and requirements of Automated Logistics Data Systems. Both programs are proof positive of the opportunities available to experienced Engineers and Analysts at CSC.

Computer and Engineering Professionals who would like to advance their careers should consider the following outstanding opportunities:

Systems Engineers

We're looking for Systems Engineers with 5-8 years' experience in Telecommunications, ADPE, Simulation and Modeling, and/or Test and Integration. 2-3 years in logistics-oriented systems, distributed systems, engineering practices in accordance with Mil. Spec. highly desirable. You must have a BA/BS degree, preferably in Math, EE or Computer Science.

Program Managers

Participate in the design and project management of on-line data processing systems including DBMS, telecommunications and logistics systems. We require 15 years' experience in the above, with 10 years in project management of defense programs specifically, and 5 years' management of programs in excess of \$5M.

Real-Time Programmers/ Computer Scientists

Participate in the design and development of software for the AEGIS Weapons System. Intermediate and senior level positions exist for individuals with experience in real-time programming in a military/scientific environment. A BS in Computer Science is preferred.

Systems Programmers

These positions involve determining program requirements as well as the design, test and integration of systems programs. Candidates should have 3-10 years' experience working in operating systems using Fortran and Assembly language. Additional experience in executive programming is a plus; A BS in Computer Science or related discipline is necessary.

In addition to competitive salaries and excellent benefits program, CSC offers challenge to match your abilities, high visibility and unequalled potential for career advancement.

For immediate consideration, please forward your resume with salary history/requirements, indicating position and location of preference, to A. Gaynor:

CSC

COMPUTER SCIENCES CORPORATION

DEFENSE SYSTEMS DIVISION
P.O. Box N, Dept. CW-1114
Moorestown, NJ 08057

An Equal Opportunity Employer
U.S. Citizenship Required

Martin Marietta Aerospace

Data Processing
Opportunities

Martin Marietta Aerospace, NASA's prime Contractor for the Space Shuttle External Tank has immediate openings for Data Processing professionals. Because we actually manufacture the external tank, you'll get to see the actual results of your efforts.

COMPUTER PROGRAMMER/ANALYSTS

Immediate opportunities exist for individuals experienced in:

• **UNIVAC 1100**
ASC11 COBOL
DMS 1100
DDL, SDDL, DMU
DML, QLP
DPS 1100, TIP
D/B Editor

• **APPLICATION EXPERIENCE**
Shop floor control, Scheduling,
Manufacturing, Inventory, Purchasing,
Configuration Management, Quality,
Engineering.

• **DATA BASE OPENINGS**
Analyst, Design, Administrators with above
hardware, software and applications
experience.

These opportunities exist at our Michoud Assembly Facility located in suburban East New Orleans.

Qualified candidates interested in learning more about these opportunities at Martin Marietta should forward resumes, including salary history to: Martin Marietta Aerospace, Denver Glazier, CW-1114, P.O. Box 29304, New Orleans, Louisiana 70189. We are an equal opportunity employer, m/f/h.

MARTIN MARIETTA

PROGRAMMER ANALYST

MIT's Information Processing Services seeks programmer and consultant for their Academic and Research Computing Services. Will develop expertise with text processing software and hardware on IBM VM/3033 and Honeywell DPS 8/70 Multics. Write and maintain Xerox 9700 printer interfaces. Assist MIT research staff, graduate students and faculty in choosing systems and software, and in solving problems that arise. Develop new services, including distributed word processing involving personal computers. Write documentation. Develop and teach short courses. BS degree plus minimum of 2 years' experience in professional environment and use of text processing software required. Excellent verbal and written communication skills essential.

Send 2 copies of resume, referencing Job No. A310 to:
Ms. Sally Hansen, MIT Personnel Office, E19-238, 77 Massachusetts
Avenue, Cambridge, MA 02139. MIT is an equal opportunity/
affirmative action employer.

MIT

position announcements	position announcements	position announcements	position announcements	position announcements
------------------------	------------------------	------------------------	------------------------	------------------------

OEM Targeting Asian Markets looking for qualified computer professionals:

- 1. **Chief Software Specialists** to lead teams in supporting system software in packaged mini/micros. Designing software in O/S, communication and databases.
- 2. **Sr Hardware Development Engineers.** To lead system integration of industrial/scientific equipment, supervising testing and maintenance.

Qualifications:
MS/MSEE with 2-4 years industrial experience. Proficiency in PDP-11 or VAX preferred. Send resume to Personnel Manager, Keytech Co., Inc. P.O. Box 1381, Stamford, CT 06904

The University of Wisconsin-Madison General Library System (GLS) is searching for an Automation Manager. This is a 12-mon. academic staff appointment that reports to the Director of the GLS. Benefits include vacation, sick leave, insurances, retirement. Salary minimum: \$30,000. Qualifications: Advanced degree in information science, computer science or library science; Education in systems analysis, principles of programming and system design, and information technology; Demonstrated ability to analyze complex systems; Proven experience in library automation with mainframe/mini computer applications; Demonstrated communication skills; Ability to teach and promote the use of information technology in libraries to library staff and campus community; Ability to develop cost analyses and budgets for automation activities. Responsibilities: Administer activities of the GLS in relation to the Network Library System (NLS) - an automated circulation system and online catalog - being developed by the UW-Madison, the University of Chicago and IBM, currently in the test phase, including responsibility for fiscal control, design and development, acceptance testing, implementation, staff training and patron relations; Provide program direction for other in-house, contracted or purchased automated systems; Advise on the use of microcomputers and bibliographic data base retrieval systems. Applications including resume, and the names, addresses and telephone numbers of 3 references who can speak to your qualifications for the position should be sent to Sandra Pfahler, Assistant Director, Memorial Library, 728 State St., Madison, WI 53706. Application deadline: Dec. 31, 1983. EEO/AA Employer.

SOFTWARE ENGINEERS
SUNBELT TO 70K
UNIX, C, PASCAL, DEC, REALTIME, INTEL, VAX, RSX-11, SCADA, SNA/SDLC, X.25.
To explore sunbelt opportunities in software design in the above environment call or send resume to:
FOX-morris
BOB GOLLIAN - 1350 Johnston Bldg. Charlotte, NC 28281 - (704) 375-0600
KYLE PURDY - Regency Center 2 - Suite 601 5501 LBJ Freeway - Dallas TX 75240 (214) 934-2350
MIKE HUNTER - 3101 Poplarwood Court Raleigh, NC 27625 - (919) 872-2940
JEFF JENNINGS - 47 Penimeter Ctr East, NE Atlanta, GA 30346 - (404) 393-0933



Some of the current opportunities available are in positions such as:

MICROWAVE DATA TRANSMISSION SYSTEMS

Communications Systems Engineer
Experience in RF communication system technology with experience in data link systems, radar tracking systems and/or command and control systems, threat evaluation, multi-plexing and encoding techniques.

Digital Systems Engineer
Experience in digital communication system technology with real-time data link systems, multi-plexing and encoding techniques, analog/digital interface, micro-processor design/application system integration and test.
Telecommunications Systems Engineer
Prefer exposure to digital

subscriber instruments and transmission components.

Scientific Programmers
Experience in real-time process control, PDP-11, HP-9845, UYK/20, UYK/44 type hardware, FORTRAN IV, BASIC, CMS-2 languages, RSX-11M and/or SDEX 20 operating systems.

Sr. RF Design Engineers
Test & Reliability Engineers
COMMUNICATIONS AND TERMINAL PRODUCTS
Terminal Design Engineers
Will be involved in the development of the new terminal products. Should have a BSEE plus minimum of two years logic design experience working with micro-processors and digital circuitry. Assignments include peripheral interface design, telephonics

communications, graphics and color terminal design.

Programmers
Positions require BSCS/BSEE and minimum one year experience in assembly level Z80 and/or M68000 programming. Assignments in computer terminal and small system development involving personal computing and CP/M operating system, graphics and CRT control, communications, I/O control, LAN and PDN development plus other challenges at the forefront of microprocessor system application.

Address all employment inquiries to:
Sperry Computer Systems
B. Dawson
322 North 2200 West
Salt Lake City, Utah 84116

Sperry in Salt Lake City

Sperry (Communications and Terminal Products, and Microwave Data Transmission Systems), will surprise you with uncommon opportunities for career growth in data communications, computer research and development, and microwave communications systems for military programs. The company is committed to research and maintaining a leading edge technology in both hardware and software systems.

Salt Lake City is a center for culture in the west. There's the Utah Symphony, the famed Ballet West, The Mormon Tabernacle Choir, theatres, an art complex, and a strong educational life built around the University of Utah, Westminster College, Brigham Young University, as well as other major universities and junior colleges in the immediate area. Coupled with the grandeur and lifestyle of the Great Salt Lake Valley, a career at Sperry can be one of the most pleasant surprises one could uncover for a rewarding future.



We are an equal opportunity employer m/f/h/v.
© Sperry Corporation 1983

SYSTEMS PROGRAMMERS/ ANALYSTS
PACIFIC NORTHWEST

The Corvallis, Oregon office of CH2M HILL, an employee-owned, multi-discipline consulting engineering firm with offices throughout North America and overseas, has career opportunities for Systems Programmers/Analysts.
Positions require BS in computer science. Experience in VAX, DEC-10 or DEC-20 operating systems preferred.
Salary commensurate with experience, excellent fringe benefits. An Equal Opportunity Employer. Qualified applicants send resume and salary requirements, in confidence, to Staffing Manager CV/SPA1, CH2M HILL, P.O. Box 428, Corvallis, OR 97339-0428.



- Engineers • Planners
- Economists • Scientists

FACULTY POSITIONS IN INFORMATION SYSTEMS
NAVAL POSTGRADUATE SCHOOL
Monterey, California

The Administrative Sciences Department of the Naval Postgraduate School has outstanding full-time (tenure track) and visiting faculty positions available at all levels in Information Systems. Opportunities exist for teaching, research and curriculum development in the areas of artificial intelligence, computer networks, database systems, decision support systems, distributed systems, economics of information systems, information systems management, knowledge-based systems, real-time systems, software engineering and management and systems analysis and design.
The School has an active program of research in Information Systems. There are excellent research opportunities for new faculty and a teaching/research load which is compatible with faculty research objectives. Extensive computer facilities are available to support research and instruction, including an IBM 3033 AP under VM/CMS and MVS, a pair of VAX 11/780 running UNIX and VMS, many mini and micro computers and access to the ARPANET.
Naval Postgraduate School salaries are nationally competitive. Minimum qualification is either a Ph.D. or D.B.A. with a major in Information Systems or a closely related doctoral degree (e.g. accounting computer science) with some industrial or governmental experience in Information Systems. ABDs will be considered if all requirements for the doctorate will be completed by September 1985. Please send resume to Professor Norman F. Schneidewind, Code 545S, Naval Postgraduate School, Monterey, CA 93943 or call (408) 646-2719 or (408) 646-3211. Equal Opportunity Employer.

COMPUTER

Work in Historic Old Town
The City of Alexandria, VA
SYSTEMS PROGRAMMER
\$24,194 - \$34,038/yr.

A full time position is available for a DOS/VSE Systems Programmer to help install, modify, and monitor system software products in support of online data base systems using DL/I, CICS/VS, DMS, and COBOL in an IBM VM, DOS/VSE 4300 environment.

Duties include systems software installation problem determination and resolution, application programmer support and system environment documentation. Candidates must have extensive experience in ASSEMBLER and COBOL, thorough knowledge of DOS operating systems, a general knowledge of data base management concepts and an ability to communicate well with all levels of City Management. Ref. DP-3-04. Applications must be received by Nov. 30, 1983.

For further information and to request an application, please call:
(703) 838-4422
CITY OF ALEXANDRIA
Personnel Office
110 North Royal Street, Suite 210
Alexandria, Virginia 22314
EEO/AA Principals Only

After work this winter,



why not stroll the beach?

Take the next step by calling Dave Smith at 1-800-821-7700, Extension 527.

you don't want to face another winter of ice, snow and all the high costs associated with northern climates, take advantage of opportunities available right now in the Sunbelt. Our clients are offering exceptional salaries and relocation packages including moving costs, mortgage differentials and more experienced computer professionals.

You'll also discover the Sunbelt offers you:

- A warm, sunny climate
- Outstanding cultural and educational facilities

- Inviting outdoor recreation, enhanced by over 4,000 miles of ocean shoreline
- Hundreds of fresh-water lakes
- Access to some of the best skiing and sports areas in the country

Listed below are sample opportunities currently available. To find out more about these or other career opportunities, call Dave Smith today at 1-800-821-7700 x527 anytime day or night. As soon as we hear from you, we'll get back to you with information about these positions. Then, if

you would like to explore them in more detail, we'll make all the arrangements in strict confidence, with no obligation to you whatsoever.

As the world's largest recruiting firm devoted exclusively to the computer profession, we can help you take the next step in your career. Call today.

If you're unable to call, write:

Dave Smith
Source Edp
P.O. Box 7100
Mountain View, CA 94037

The Sunbelt offers you so much! \$24,000—\$90,000

Florida, Georgia, South Carolina

Banking Analysts—Management Potential. Large Florida statewide bank seeks Banking Analysts for its latest IBM state-of-the-art data center. Continuing formal training programs provide excellent management promotion opportunities. Bankers with programming, analysis, project leadership, systems programming, data communications experience preferred. To \$34,000.

Manager of Systems and Programming—On-line Environment. Growing Florida company with over \$300 million in sales seeks an aggressive Manager to oversee over 12-person department. CICS, PL/1, DB/DC experience preferred. To \$38,000.

Programmer Analyst—Learn CICS. Miami based firm seeks a professional to work in its state-of-the-art IBM 4341 OS/VSE environment. Two years of COBOL programming experience preferred. CICS training provided. To \$25,000.

Programmer Analysts—Project Leader Potential. Large Florida financial institution seeks Analysts for both its Miami and Tampa data centers. IBM OS/VS, COBOL, BAL environment offers career path leading to Project Leader. To \$29,000.

Consultants—Programmer Analysts. A major division of a communications utility is moved to Orlando and requires multiple Programmers with heavy experience in IMS DB/DC and PL/1. To \$40,000.

Programmer Analysts—Banking. Leading Florida financial institution seeks professionals to work in its state-of-the-art IBM environment. Excellent internal training program provided. To \$30,000.

Consultant—Big 8. Prestigious Big 8 CPA firm seeks experienced computer professionals for its Southern Florida Management Advisory Services Group. Broad business experience a plus. Excellent growth opportunity. To \$34,000.

Programmer/Analysts. Major Florida financial services organization has an excellent opportunity for experienced IMS DB/DC Applications Programmers. Excellent internal training program. Suburban location. To \$32,000.

System Programmer. South Florida-based corporation with newly installed IBM 4341 seeks a DOS/VSE Systems Programmer to become its resident expert. To \$32,000.

Series 1—RPS Analyst. Atlanta-based company seeks an experienced Series 1 RPS professional to develop a new point sale network. Company has purchased 100 Series 1 units to implement this dynamic project. Position requires two years programming experience in an RPS environment. To \$35,500.

Data Base Sales Representative—Move up to Branch Manager. Rapidly growing manufacturer of intelligent data base machines seeks a proven sales professional to start and manage an Atlanta branch. Excellent growth opportunity. Estimated first-year earnings \$2,000 with a \$40,000 base salary.

Software Sales Representatives. International manufacturer of CPA industry software with 2000 installations in all 50 states is expanding its Atlanta sales force. Position requires two years of

quota measured sales experience with small business computers and a general knowledge of fundamental business financial applications. First year compensation to \$65,000.

IMS Applications Analysts—Will Relocate. Prestigious Atlanta software development organization needs IMS DB/DC Analysts for a major national project. Join a very professional peer group and enjoy a complete relocation package to metro Atlanta. Two years of specific DB/DC expertise sought. To \$37,500.

Banking Programmers and Analysts. One of Atlanta's largest financial institutions seeks professionals to design and implement a major ATM project in an OS/MVS, TSO environment. Team members will work directly with top management to define, plan, schedule, and implement this dynamic system. One year of banking data processing experience needed. To \$34,700.

Communications Specialist—Super Benefits. Atlanta division of a world renowned manufacturer of aircraft is increasing its technical support staff in communications. Three years of installation and maintenance of ACF/VTAM, ACF/NCP and BYSYNC SDLC helpful. Network planning and debugging is preferred. Benefits include a complete relocation package and comprehensive fringe benefits. To \$40,000.

Consultant—Partner Potential in National CPA Firm. Firm with heavy concentration in medium-sized client firms seeks a DP Consultant to expand its Atlanta practice. Bachelor's degree, excellent communications skills, and a broad industry reference base support. Will gain a broad exposure to a variety of computer hardware applications. Career path to partner. To \$37,500.

CICS Analysts—Move into Development. Well-known Atlanta-based service organization is increasing its Analyst staff to implement a major on-line development. Career growth opportunity provides "blue chip" benefits, top salaries, internal education and a recession-proof industry. Two years CICS applications work in a medium to large scale IBM environment sought. To \$32,500.

IBM Applications—Train for DBA. Major southeastern service firm is offering the right professional a career path to Data Base Administrator. Will join two current DBAs in a major relational data base endeavor. Two years of heavy IMS applications experience and good communications skills sought. Beautiful surroundings in South Carolina and a complete relocation package are included. To \$32,400.

Manufacturing Systems Analyst. South Carolina manufacturer of heavy equipment seeks an Analyst who understands and relates to manufacturing users. Three years of manufacturing background in an IBM OS environment needed. IMS DB/DC knowledge, MRP and Process Control are definite pluses. Nice rural location close to a major suburban vicinity. To \$34,000.

Louisiana, Mississippi

Senior Manufacturing Systems Analyst—High Visibility. Fortune 200 corporation requires degree plus 5 years experience with a background in directing the analysis and design of large-scale manufacturing applications. Data base environment, excellent corporate exposure, very prestigious firm in New Orleans. To \$37,000.

IDMS System Analyst. Join the processing shop of one of the leading international engineering companies based in New Orleans. Position offers IDMS on-line development of financial and engineering applications. Current technical expertise in OS/MVS, IDMS and COBOL skills sought. To \$36,000.

UNIVAC 1100 Programmer Analyst—Excellent Relocation Package. Major manufacturing company, based in New Orleans, seeks Programmer Analyst for their UNIVAC 1100/83, DMS and COBOL environment. To \$39,000.

Senior Real-Time Systems Analyst—New Orleans. Major NYSE corporation requires person with six or more years in the design and documentation of real-time operating software, with knowledge of data base management software and techniques. Large-scale R/T installation experience a plus. To \$42,000.

IMS Systems Programmer. Multi-state organization based in New Orleans requires two years experience in the installation, maintenance and tuning of IMS DB/DC software. Multi-processor state-of-the-art environment moving to OS/XA. To \$38,000.

Senior systems Analyst—New Orleans. Major IMS shop seeks a Senior System Analyst with five years experience in data base, financial systems and PL/1. Good problem solving ability and affords excellent career opportunities. Outstanding relocation package. To \$36,000.

Scientific/Engineering Analyst. Fortune 100 New Orleans company seeks HP1000 real-time experience, using FORTRAN in a process control environment. Excellent fringe benefits and relocation package to New Orleans. To \$32,000.

IMS Systems Analyst—Oil and Gas. Prestigious southeastern headquarters of oil and gas corporation seeks Systems Analyst to participate in the development of on-line IMS-DB/DC oil and gas production reporting system. New Orleans. To \$35,000.

Texas, Oklahoma

Programmer Analysts—New DB/DC Projects. Corporate staff of a rapidly expanding Dallas Fortune 500 organization seeks experienced professionals with strong OS COBOL background. All applications projects are new and involve IMS DB/DC. To \$29,000.

Systems Analyst—Exposure to Senior Corporate Management. Large financial services organization seeks Internal Systems Consultant. Banking systems background preferred. To \$36,000.

Director Systems Development Firm. \$2 billion firm seeks an accomplished Manager to direct development efforts of three Managers and 50 professionals. IBM experience preferred. Good communications and people skills required. Dallas location. To \$65,000.

Microcomputer Development—Unique Projects. Worldwide company based in Dallas seeks several Microcomputer Systems Software Programmers to participate in leading edge commercial systems. Will use Intel 8086 with Assembler Language. To \$36,000.

CICS Systems Programming Manager—Worldwide System. International organization in Texas with worldwide

network seeks individual to supervise IBM technical support people. Data center composed of IBM 3033, Amdahl 470, MVS, JES 3, CICS, ACF/NCP/VTAM. To \$39,000.

Regional Sales Manager—Turnkey Financial Systems. National computer products firm seeks a current Sales Manager based in Dallas to direct sales efforts for multistate area. Minicomputer background preferred. Base salary to \$48,000.

ACP Programmer. Successful, Dallas-based airline seeks experienced ACP/ PARS Programmers to participate in new development. Group will expand 100% over next 12 months. To \$38,000.

Systems Software Development—Operating Systems. Acknowledged leader in software packages seeks a professional to develop software for use by Systems Programmers. IBM ALC or systems software experience required. Dallas location. To \$38,000.

IMS Programmer Analysts—Rapid Growth. An expanding Houston financial institution is adding to staff due to increased market activity. They seek several individuals with banking application development experience with IMS DB/DC exposure. To \$35,000.

Lead Development Analyst—Relocation Package. Outstanding opportunities are available to participate in a major software development effort with this Houston-based firm. Three-plus years of COBOL or FORTRAN experience using PRIMOS sought. Will provide relocation assistance. Rural location. To \$42,000.

Software Designers. State-of-the-art developer of mini/micro software products is rapidly expanding and is in need of experienced design specialists with experience in UNIX & C. Houston location. To \$50,000.

Senior Database Analyst—High Visibility. Progressive Houston-based firm seeks senior with IDMS skills. Opportunity for great management visibility. Will be groomed to direct the activities of the DBA team. Heavy IDMS DB/DC skills required. To \$41,000.

Project Leader—Gain New Exposure. A rare opportunity to join a company at the ground floor is available in the North Houston area. Will be a member of a team developing new software for the hospital industry using a new relational database product. Recent industry experience using PCS, SHAS, etc. is required. To \$43,000.

Senior Programmer Analysts. Major energy corporation in Houston is expanding its database development staff. Solid COBOL and IDMS or IMS skills combined with analysis and design experience sought for these very visible opportunities. To \$38,000.

Sales Representative—Growth Company. Developer of a mini/micro based database management system is seeking a career-minded individual to expand its Houston staff. Experience selling relational or hierarchical database products and a desire to be the best are required. \$80,000 package.

Supervisor—Consulting Services. Expanding practice of a management consulting company is seeking a proven performer. Beautiful Austin-based location. To \$40,000.

Data Base Analyst—IMS Design. Will provide technical support both internally and to clients of this leading financial software firm. Currently developing entirely new version of industry leading packages. Beautiful Texas hill country location. To \$42,000.

Programmer/Analyst—Four-Day Week. State-of-the-art IBM environment; including IMS DB/DC. This is a new systems development. A four-day work week permits you to enjoy the South Texas sunshine. To \$34,000.

System Programmers. Two new IBM OS environments are seeking Systems Programmers with MVS internals experience. VM or CICS experience a plus. San Antonio Area. To \$40,000.

Programmer/Analyst. Two or more years insurance systems experience. IBM environment in a fast-growing, Austin-based company. To \$30,000.

Communications Specialist. IBM specialist needed with skills in SDLC/SNA. Challenging growth area of the company. San Antonio location. To \$40,000.

Scientific Systems Developers. CAD/CAM vendor in beautiful area of South Texas needs several good FORTRAN Systems Developers. Experience in placement or routing of circuit boards helpful. To \$40,000.

Programmer Analyst—Energy. Large petroleum corporation with headquarters in Tulsa seeks a professional with two years of OS COBOL and accounting applications experience. CICS and IDMS experience preferred. To \$30,000.

Systems Programmers—Learn MVS. Oklahoma corporation seeks qualified Systems Programmers with a minimum of three years experience as a Systems Programmer. State-of-the-art environment. To \$45,000.

Programmer Analysts—Data Center Expansion. Manufacturing corporation with headquarters located in a Tulsa suburb seeks Programmers for its small but growing data processing center environment. Three years experience with CICS and DOS/VSE background required. To \$32,000.

Programmer Analyst—New Development. Industry leader located in rural Oklahoma seeks a professional for its DOS/VS and CICS environment. One year of DOS COBOL experience and financial applications experience required. To \$24,000.

Programmer Analyst—Unique Benefits. Major transportation corporation seeks professionals with PL/1 coding experience and IMS applications. Tulsa location. To \$35,000.

EDP Auditor—New Position. Rapidly expanding Tulsa corporation seeks a professional with a minimum of one year EDP auditing experience. To \$30,000.

Marketing Representative—Management Potential. Major national corporation located in Tulsa seeks an experienced data processing Marketing Representative to cover a large, lucrative territory. Career path leads to sales management. Estimated first-year earnings \$45,000.

DBA—Ground Floor. Oklahoma based corporation seeks a professional for its state-of-the-art IBM data center. A minimum of three years IDMS design experience required. To \$45,000.

source edp
Personnel Services

The world's largest recruitment firm that specializes exclusively in the computer profession.

position announcements

position announcements

position announcements

position announcements

position announcements



Match your high performance hardware with high performance "peopleware."

If you, and your users, are frustrated by DP staff vacancies, call us today! We'll find, screen and help you hire the professionals to do the job you want done.

Call our DP specialist listed in your area:

ALABAMA Huntsville Mobile Tuscaloosa	205 / 539-2244 205 / 479-6566 205 / 345-0120	NEBRASKA Lincoln Omaha	402 / 467-5549 402 / 397-8115
ARIZONA Phoenix Scottsdale Tucson	602 / 945-2121 602 / 941-1515 602 / 293-9666	NEVADA Las Vegas Reno	702 / 737-3909 702 / 826-5243
ARKANSAS Little Rock Springdale/Fayetteville	501 / 661-1650 501 / 751-4000	NEW JERSEY Bergen County Cherry Hill Clifton Essex County Monmouth County Morris Plains Pompton Lakes (Passaic County) Princeton Sussex County	201 / 445-9600 609 / 662-2660 201 / 779-6161 201 / 864-3100 201 / 747-2400 201 / 538-8800 201 / 839-0880 609 / 452-7711 201 / 691-2000
CALIFORNIA Burlingame Costa Mesa/Santa Ana Laguna Hills (Orange County) Los Angeles (Encino) Menlo Park Newport Beach Oakland Sacramento San Diego San Francisco Santa Barbara Santa Rosa Sausalito (San Francisco Bay Area)	415 / 692-8500 714 / 751-1424 714 / 768-9112 213 / 906-3155 415 / 328-8024 714 / 553-0311 415 / 452-0140 916 / 920-0441 619 / 299-4940 415 / 981-5950 805 / 683-1451 707 / 526-9500 415 / 331-5161	NEW MEXICO Albuquerque	505 / 294-0100
COLORADO Boulder Colorado Springs Denver Golden	303 / 447-9900 303 / 471-3620 303 / 758-8585 303 / 279-0367	NEW YORK Auburn Buffalo Forest Hills Manhattan/57th Street Manhattan/Park Avenue Rochester Rockland County Syracuse Woodbury	315 / 252-9511 716 / 852-5520 212 / 275-2121 212 / 765-1802 212 / 661-7310 716 / 325-1660 914 / 735-7015 315 / 471-7161 516 / 364-9290
CONNECTICUT Hamden Hartford Stamford Waterbury	203 / 248-0770 203 / 528-4434 203 / 324-2232 203 / 755-9228	NORTH CAROLINA Charlotte Kinston Raleigh	704 / 527-6800 919 / 527-9191 919 / 781-0400
DISTRICT OF COLUMBIA Washington	202 / 466-5300	OHIO Akron (Cleveland) Ashland Butler County (Cincinnati Area) Canton Cincinnati Cincinnati (Northwest) Cleveland (Downtown) Cleveland (North) Columbus Dayton Lorain/Elyria Sidney Toledo Washington Court House Youngstown	216 / 867-2900 216 / 621-7387 419 / 289-9643 513 / 874-6901 216 / 497-0122 513 / 651-5500 513 / 851-6661 216 / 623-0022 216 / 261-7696 614 / 436-3200 513 / 228-8271 216 / 236-3921 513 / 498-4575 419 / 865-4908 614 / 335-8744 216 / 788-4037
FLORIDA Bradenton Clearwater Jacksonville Lakeland Miami (Coral Gables) Miami (North) Orlando Pensacola St. Petersburg Tallahassee	813 / 792-2568 813 / 796-1972 904 / 356-8513 813 / 665-8077 305 / 448-1608 305 / 576-5260 305 / 841-4100 904 / 476-1703 813 / 577-2116 813 / 923-3671	OKLAHOMA Tulsa	918 / 622-6632
GEORGIA Atlanta Atlanta (North) Atlanta (Northwest) Augusta	404 / 455-4132 404 / 998-1555 404 / 955-2785 803 / 648-1361	OREGON Portland	503 / 287-8701
IDAHO Boise	208 / 336-6770	PENNSYLVANIA Bucks County (Philadelphia Area) King of Prussia Lancaster McMurry Philadelphia Pittsburgh (South Hills) Reading Willow Grove	215 / 757-1543 215 / 964-1200 717 / 299-2811 412 / 941-1340 215 / 665-9430 412 / 922-5200 215 / 372-4756 215 / 657-6250
ILLINOIS Barrington Hills Bloomington Champaign Chicago (Downtown) Des Plaines (O'Hare) Elgin Springfield	312 / 639-1112 309 / 828-3317 217 / 398-0050 312 / 648-1800 312 / 297-7102 312 / 697-2201 217 / 753-3100	SOUTH CAROLINA Aiken Charleston Columbia Greenville Myrtle Beach Rock Hill Spartanburg	803 / 648-1361 803 / 556-6461 803 / 779-8272 803 / 235-8581 803 / 248-7259 803 / 324-5181 803 / 573-7427
INDIANA Fort Wayne Indianapolis Richmond South Bend	219 / 432-3500 317 / 257-4261 317 / 935-3356 219 / 233-9353	TENNESSEE Chattanooga Knoxville Memphis Nashville	615 / 870-2148 615 / 690-6031 901 / 794-3130 615 / 377-1130
IOWA Cedar Rapids Mason City Quad Cities/Bettendorf Waterloo/Cedar Falls	319 / 366-8441 515 / 424-1680 319 / 359-3503 319 / 236-1510	TEXAS Amarillo Arlington/Fort Worth Austin Beaumont Bryan/Colege Station Dallas Dallas/Highland Park El Paso Houston Plano San Antonio	806 / 353-9549 817 / 469-6161 512 / 327-8292 713 / 866-0303 409 / 693-2200 214 / 934-9503 214 / 521-8810 915 / 778-9411 713 / 850-9850 214 / 596-6655 512 / 826-8666
KANSAS Overland Park Topeka Wichita	913 / 648-1706 913 / 267-5430 316 / 681-3330	UTAH Salt Lake City	801 / 364-5700
KENTUCKY Bowling Green Lexington Louisville	502 / 782-9152 606 / 268-8865 512 / 456-4330	VIRGINIA Dulles Airport (Sterling) Fairfax County South (Arlington) Lynchburg Newport News Richmond Virginia Beach	703 / 471-6868 703 / 573-2042 804 / 528-1611 804 / 599-5929 804 / 285-2071 804 / 499-9858
LOUISIANA Baton Rouge Lafayette New Orleans Shreveport	504 / 927-4700 318 / 261-1188 504 / 581-3655 318 / 688-4100	WASHINGTON Seattle Seattle/North (Lynnwood) Seattle/South Tacoma	206 / 328-0936 206 / 775-0661 206 / 241-2444 206 / 627-1972
MARYLAND Annapolis Baltimore (Towson) Columbia Frederick Laurel	301 / 841-6600 301 / 321-1760 301 / 995-1040 301 / 663-0600 301 / 953-7000	WISCONSIN Appleton Green Bay Milwaukee Milwaukee/North Racine Wausau	414 / 731-5221 414 / 437-4353 414 / 273-4430 414 / 961-2050 414 / 886-1810 715 / 842-2212
MASSACHUSETTS Boston	617 / 262-5050	WYOMING Cheyenne	307 / 635-8731
MICHIGAN Ann Arbor Birmingham Dearborn Grand Rapids Kalamazoo/Portage Lansing Rochester Segnow St. Joseph	313 / 769-1720 313 / 647-2828 313 / 336-6650 616 / 534-7211 616 / 381-1153 517 / 694-1153 313 / 652-6800 517 / 790-5900 616 / 429-6555		
MISSISSIPPI Centrel Mississippi	601 / 969-5523		
MISSOURI Kansas City St. Louis (Airport) St. Louis (Downtown)	816 / 221-4550 314 / 731-6800 314 / 241-5866		

PROGRAMMER/ PROGRAMMER ANALYSTS

PRATT & WHITNEY is seeking individuals with a Degree in Computer Science or related area and 2-5 years experience with COBOL, IBM JCL, MVS, TSO, SPF, IMS DB/DC on large IBM main frames in the following areas:

- Business Applications
- Data Center Applications
- Operations Analysis
- Computer Telecommunications Specialist (IBM 3274 and 3705/3725 experience)
- Computer Security Specialist (MVS or VM Software Controls & Procedures)

The opportunities we offer combined with our excellent South Florida climate and superb recreational facilities are unbeatable — our employees love it here — so will you.

Please send your resume to Professional Placement, P.O. Box 2691, West Palm Beach, FL 33402.

It's time to migrate to FLORIDA



UNITED TECHNOLOGIES PRATT & WHITNEY

An Equal Opportunity Employer M/F

EDP OPPORTUNITIES

SALES

DB NYC NJ PA\$35 Base to \$100M
30% travel N.E. decision support
Wall St or Find knowl nec.....\$Base +

CICS

Wall St OS MVS Dev\$Open
PM interactive find svcs.....\$55M

WALL ST

Project mgr Wall St exp\$55M +
PM CICS Cobol OS MVS\$50M +
Project Mgr OS VS I CICS\$50M

ANALYST

Wall St Mktg Supvse dev. Deg\$Open
Mktg fincl design BS\$40M

MBA

Mgr VM/CMS, Focus MBA\$55M
Focus Heavy\$43M +
Focus Fincl JYI dev\$44M
Focus VM/CMS\$37M

PROGRAMMER

System 34 RPG Programmer Operator
expanding co\$30-35M

SOFTWARE

Group mgr software Jes 3\$60M
Project mgr CICS APS dev staff 12\$55M
NJ DOS Operating sys dev\$50M
NJ DBA VSAM CICS IMS\$41M
Tandem Cobol\$35M
Disaster Recovery\$35M
Std's & procedures\$30M

Bill Borelli (212) 349-3610
WM. HARRIS ASSOC.
25 Ann St agency N.Y., N.Y. 10038

PROGRAM DIRECTOR IN COMPUTER SCIENCE

Applications are invited for a position as Director of a Program in Computer Science. The Director is responsible for coordinating the College's offerings in computer science, for developing new courses in this area at the intermediate and advanced levels, and for directing an interdisciplinary concentration in Computer Science. Of primary importance are the ability to provide leadership in curriculum development and a commitment to excellent undergraduate education. Assistant Professor rank (Ph.D. completed) preferred; 3-5 year appointment. This is a newly created position, and continuation of the program and the position beyond five years is subject to review. Preferred starting date is September 1984. Applicants should submit a resume and have three letters of reference sent to Prof. John R. Boccio, Chairman, Dept. of Physics, Swarthmore College, Swarthmore, PA 19081. Deadline for applications is February 15, 1984. An Equal Opportunity Employer.

Programmer/Analyst City of Midland \$25,985 - \$31,182

Requires a minimum of five years full time work experience in automated data processing with two years of that experience employing system design methodology and broad applications of RPG II/III. One year full time work experience on an IBM System 38 or completion of the IBM System 38 training curriculum. An Associates Degree in automated data processing may be substituted for one year's A.D.P. experience and a Bachelor's Degree in automated data processing may be substituted for two year's A.D.P. experience. Send resume to Personnel Director, City Hall, 202 Ashman Street, Midland, Michigan 48640 by Wednesday, November 30, 1983. An Equal Employment Opportunity Employer.

Programming

IMS DB/DC MARK V SVC 26, 99

Openings in Santa Monica and Los Angeles, CA

TELOS offers good pay and hard work to proven achievers with IBM applications and systems software experience. We are looking for two Systems Programmers and five Applications Programmers with the following credentials.

SYSTEMS PROGRAMMERS

MVS internals, VSAM, assembler, IMS (optional)

APPLICATIONS PROGRAMMERS

IMS DB/DC, COBOL, MARK V (optional), ADF (optional)

Please rush your resume to Phil Shaefer at:

TELOS CORPORATION

3420 Ocean Park Blvd.
Dept. PS 2
Santa Monica, CA 90405
(213) 450-2424

U.S. Citizenship Required
Equal Opportunity
Employer M/F



EXCEPTIONAL OPPORTUNITY FOR RPG II/III PROGRAMMERS

At Marcam Data Systems, our rapid growth has produced a number of immediate openings for creative, ambitious programmer/analysts.

If you have 1-3 years of RPG programming experience on an IBM System/34 or System/38, come join us in the move to our new offices, now under construction just outside of Boston. You'll work with the best technical people in the field, on Marcam's in-house System/34, System/36 and System/38.

Marcam is the largest producer of MAPICS enhancement software. Included among our national and international clients are many Fortune 100 companies. Our salary and benefits package reflects Marcam's industry prominence.

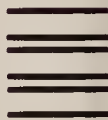
If our dynamic, professional environment intrigues you, please send your resume to: Tom Ebling, Vice President for Product Development, Marcam Data Systems, 123 Highland Avenue, Needham, MA 02194.

MARCAM the MAPICS enhancers

Compu Search®

MANAGEMENT RECRUITERS®

Understanding your DP needs is our first concern!®



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 709 FRAMINGHAM, MA 01701

postage will be paid by

CIRCULATION DEPARTMENT



COMPUTERWORLD

375 Cochituate Road, Rte. 30
Box 897
Framingham, MA 01701-9985



position announcements

position announcements

position announcements

position announcements

position announcements

S O F T W A R E P R O F E S S I O N A L S

IF YOU LIKE THE CHALLENGE OF A NEW JOB, DIGITAL HAS A JOB THAT CHALLENGES YOU AGAIN AND AGAIN.



To fill them, we are looking for experienced software professionals at all levels. Appropriate applications experience, familiarity with Digital products, and advanced degrees are highly desirable.

Successful candidates will get the fully competitive salary, excellent benefits, and unparalleled advancement opportunities only the world's second largest computer company can provide. Some positions may require U.S. citizenship.

And, these software positions are available in your choice of Digital locations around the country.

That's because your job with Digital can change with you as your interests and your capabilities change. You can be in on any of a large variety of leading edge projects in finance, manufacturing, health, communications, robotics, artificial intelligence. Or in any of the other areas Digital serves. You'll participate in these projects from conception through production, marketing through sales, in an unstructured environment that rewards initiative rather than seniority. So, when you successfully finish one assignment, you'll move right on to another challenging opportunity.

There are opportunities for Applications Programmers to work on forms management systems, transaction management, and distributed office automation. For Software Support Specialists to consult with Digital field service representatives, using knowledge of Digital operating systems, to solve customer problems. And for Software Specialists in sales, installation, warranty and contract services. All these positions support Digital's personal computers—Rainbow 100, DECmate II, and Professional 350—PDP-11 and VAX systems.

WESTERN REGION—
Santa Clara, San Francisco/Oakland, Seattle/Portland, Denver/Salt Lake City, Colorado Springs

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1031
2525 Augustine Drive
Santa Clara, California 95051

CENTRAL REGION—
Chicago, Minneapolis, Detroit, St. Louis, Indianapolis, Milwaukee

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1031
North Atrium Center, Building 1
1155 West Dundee Road
Arlington Heights, Illinois 60004

NORTHEAST REGION—
New England and Upstate New York

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1031
5 Burlington Woods Drive
Burlington, Massachusetts 01803

NEW YORK/NEW JERSEY REGION—
New York City, Westchester, Long Island, Parsippany, Piscataway

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1031
Corporate Park 287
20 Corporate South
Piscataway, New Jersey 08854

MID-ATLANTIC REGION—
Washington, D.C., Philadelphia, Ohio Valley

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1031
8301 Professional Place
Landover, Maryland 20785

SOUTHWEST REGION—
Los Angeles area, Orange County, San Diego, Phoenix, and Albuquerque

Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1031
6101 West Centinela, Suite 1
Culver City, California 90230

SOUTHERN REGION—
Houston, Dallas, Atlanta, Charlotte, Knoxville, New Orleans, Memphis, Tampa, Orlando

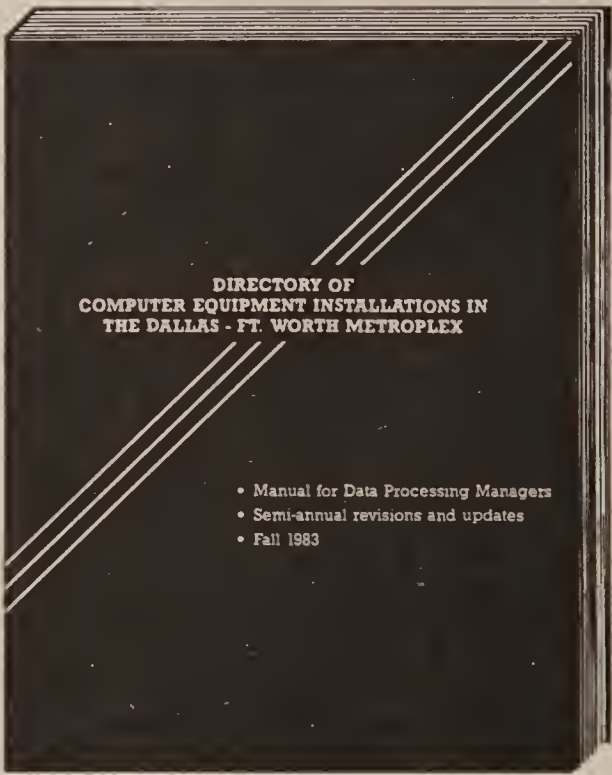
Write to: Employment Representative
Digital Equipment Corporation
Dept. CW 1031
5775 Peachtree Dunwoody Road, Suite 100-D
Atlanta, Georgia 30342

If interested, send your resume or a letter outlining your qualifications to the employment representative at the location that interests you.

We are an affirmative action employer.

digital™

\$\$ SEVERE SHORTAGE OF
DATA PROCESSING PROFESSIONALS
IN DALLAS \$\$



Addison
Allen
Arlington
Bedford
Carrollton
Coppell
Dallas
Denton
Duncanville
Euless
Farmers Branch
Fort Worth
Garland
Grand Prairie
Grand Saline
Grapevine
Irving
Lewisville
Mesquite
Plano
Richardson

- Hundreds of Firms including Corporate Names, Addresses, and Phone Numbers
- Names of Hiring Authorities
- Computer Hardware
- Programming Languages
- Semi-Annual Updates and Revisions
- All Listings Current—Money Back Guarantee

To obtain copies of this directory, fill out the form below and enclose check or money order in the proper amount payable to: Lewis And Associates, P.O. Box 225828, 6350 LBJ Freeway, Dallas, Texas 75265-9990

ORDER FORM

Check appropriate box:

- | | |
|--|----------|
| <input type="checkbox"/> 1-4 copies (\$39.95 each) | \$ _____ |
| <input type="checkbox"/> 5-10 copies (\$34.95 each) | \$ _____ |
| <input type="checkbox"/> Over 10 copies (\$29.95 each) | \$ _____ |
| Add 5% Sales Tax | \$ _____ |
| Subtotal | \$ _____ |
| Plus Postage and Handling | \$ 4.95 |
| TOTAL (Amount Enclosed) | \$ _____ |

Amount enclosed _____

Name (Individual and/or Corporate) _____
Address: _____ City, State, Zip _____

(Due to Large Number of Requests, Allow 3-4 Weeks for Delivery)

YOUR FUTURE
IS IN
FLORIDA!

Move up to consulting status in the exciting, fast-growing Sunshine State. Florida's most prestigious consulting firm is looking for EDP Professionals with expertise in any of the following areas:

COBOL
FORTRAN
PL/1
ASSEMBLER
C

EDL
FOCUS
SAS
CICS
NATURAL

ATM
MVS
UNIX
EDX
IMS DB/DC

MODEL 204
ADABAS
IDMS
IMAGE
GCOS

Send resume, along with salary history, to:
Mr. Fred Pawlaczyk
Corporate Technical Director



SOFTWARE SERVICES OF FLORIDA, INC.

A subsidiary of Orbitron International

ONE PLAZA PLACE, N.E. • SUITE 400 • ST. PETERSBURG, FL 33701 (813) 823-7138

System Engineers
and Programmer/Analysts



take
one
giant
step

Our approach to the diversified technical requirements of today's changing business world is diversified computer consulting services. Our involvement in remote computing, management consulting, applications development, systems software support and education invites the ambition of career minded people. Because the more services we can offer our worldwide clientele, the more opportunities we can offer the versatile professional.

General Electric Professional Services Company has a commitment to define tomorrow's total software solutions. That's your giant step to professional growth... to the future. Be there with us.

Immediate positions are available for Systems Engineers and Programmer/Analysts with a minimum of 3-5 years experience in any of the following areas:

- COBOL, FORTRAN, ASSEMBLER, ADA, PL/1, "C" Language
- CICS, IMS
- IBM, Honeywell, DEC-VAX, AN/UYK and MICROS
- Preferred experience in Software Design

General Electric Professional Services Company has immediate opportunities for qualified individuals in Buffalo, Rochester, Syracuse, Albany and all our other offices throughout the United States.

We offer a competitive salary plan, benefits, relocation expenses and tuition reimbursement. Please forward your resume in confidence to: Ms. Debra Van Wert, General Electric Professional Services Company, 9 Tobey Village Office Park, Pittsford, NY 14534

We work for the best.

We want the best working for us.



INFORMATION
SERVICES

General Electric Professional Services Company

An Equal Opportunity Employer M/F

Data Processing
Opportunities

Knoll International, Inc., designers and manufacturers of distinctive executive office furniture, is currently expanding its corporate MIS department. Unprecedented growth has created the following opportunities:

Data Base Administrator

We require a minimum of 5 years data processing experience in an IBM environment. Qualified candidates will possess extensive experience in DL/1, COBOL programming and data base generation (DBD, PSB, PCB, etc.). Experience with data dictionaries is also necessary. Experience in applications analysis and a background in a manufacturing environment is desirable.

Sr. Systems Programmer

We require a minimum of 5 years data processing experience in an IBM environment for this broad based technical support position. Experience should include systems generation. Expertise in DOS/VSE operating systems, CICS and DL/1 are required. BTAM and VTAM knowledge as well as manufacturing environment experience are preferred. We are seeking a team player with an ability to document systems processes, maintain existing software and implement new software.

We are located 40 miles northwest of Philadelphia. Knoll International offers challenge and opportunity plus competitive starting salary, relocation allowance and outstanding benefits package. For more information, send letter and resume, stating salary requirements, in confidence to:

Employment Manager
Knoll International, Inc.
P.O. Box 157
East Greenville, PA 18041-0157

An equal oppty/affirmative
action employer m/f/h/c

Knoll

position announcements	position announcements	position announcements	position announcements	position announcements
------------------------	------------------------	------------------------	------------------------	------------------------

PROGRAMMER

SENIOR PROGRAMMER/ANALYST

The Fox Chase Cancer Center, a major biomedical research center located in NE Phila., seeks a talented self-motivated individual for our research computer center. Responsibilities include consulting and project work in a variety of areas including: data base management, graphics, data acquisition, communications, and image processing on DEC VAX and PDP-11 equipment. Excellent benefits and facilities. Send resume and salary requirements to:

SENIOR PROGRAMMER
PERSONNEL DEPT.
FOX CHASE
CANCER CENTER
7701 Burlholme Ave.
Phila., PA 19111
Equal Opportunity Employer

Director of Data Processing

The San Bernadino County Superintendent of Schools is seeking a Director of Data Processing. The Director's responsibilities will include establishment of a county schools computer center, acquisition of software, hardware and services; modification, development and implementation of applications software systems; direction of a management information system for the county superintendents and school districts throughout the county; training, consultation and guidance for all customers of the services of the computer center using Hewlett Packard 3000 equipment. San Bernadino County is located in the center of Southern California and its residents enjoy an ideal climate and easy accessibility to Los Angeles and Palm Springs. Minimum qualifications are a bachelor's degree from a 4 year accredited college or university including or supplemented by courses such as data processing, systems and procedures analysis, information storage and retrieval systems or project planning and control techniques; knowledge of management practices and budgetary planning and control; knowledge of long range planning techniques; ability to communicate effectively in both oral and written form. Salary range \$47,120.76 to \$49,400.76 (1983-84). For further information and application materials, please contact (714) 383-3537 or write:
San Bernadino County
Superintendent of Schools
201 North E Street
San Bernadino, California 92415
Closing Date December 28, 1983

SUNSHINE STATE

Florida's DP community is Booming!!
Our clients need your expertise.
ANALYSTS/PROGRAMMERS

P/A COBOL or PL1 or BAL w/CICS To 30K
P/A MVS COBOL w/Bank systems. To 28K
P/A COBOL & IMS w/business sys. To 33K
P/A Tandem TAL w/business sys ... To 30K
Proj. Mgr - ATM's, 3600/4700 To 38K
S/A - MVS & Bank Systems..... To 35K

Call for other positions

SYSTEMS PROGRAMMERS

MVS, VM/SP - 2 yrs plus To 36K
ACF/VTAM, SNA NCP To 38K
IMS DB/DC Need Sys Prog & DBA. To 37K
DBA's - IDMS, Model 204, ADABAS, IMS To 36K

AVAILABILITY, INC.
813/872-2631
Dept. C., P.O. Box 25434
Tampa, Florida 33622

In Florida or Texas, the outlook is sunny with E-Systems.

E-Systems is an electronic systems company working at the very leading edge of technology. The company has a solid record of growth and profit.

In fact, the FORTUNE 500 directory shows that E-Systems is number one in total return to investors over the past 10 years.

So with E-Systems, you not only have the rewards of working to shape the future of technology, you also have the security and benefits of one of the most solid companies around.

The best of both worlds.



E-SYSTEMS

The problem solvers.



The ECI Division in St. Petersburg has a place in the sun for talented Data Communications Professionals.

The ECI Division develops and produces military communications systems, electronic data-handling systems and microwave phased array antennas.

MEMBER TECHNICAL STAFF—Software—To serve as Technical Consultant for the Division's Software products. Minimum of 10 year's real-time systems design and implementation experience required as well as strong background in Mathematics. Digital interfaces. Digital Communications, and DOD Software Development Methodologies.

SOFTWARE DESIGNERS—BSCS BSEE and five years experience in real-time embedded computer systems utilizing assembly and higher order languages. Significant hardware-software interfacing experience, and the ability to perform analysis, design, and implementation of sophisticated weapon system software.

For immediate consideration please forward your resume to:
Mr. Tim Harris, Director of Employee Relations, E-Systems, Inc., ECI Division, P.O. Box 12248, St. Petersburg, FL 33733.

The Garland Division in Dallas has "heart-of-the-sunbelt" opportunities for talented Software Professionals.

The Garland Division is involved in high tech communications, command and control systems, electronic warfare, computer-based intelligence and reconnaissance systems, and digital image processing.

SENIOR SOFTWARE ENGINEERS

Experienced Software Engineering Professionals in all areas including:

- Office Systems Specialist —With WANG OIS experience. Communications networking experience a plus (develop long-range office systems plans)
- Data Base Administrator —VAX system using VMS
- Artificial Intelligence Specialist —Ph. D. or equivalent with 5 years related experience: LISP proficiency expected.

Prefer 6 years experience for all positions.

SOFTWARE ENGINEERS

Requires a BS in EE or Computer Science with experience in Pascal or Structured FORTRAN. Prefer a strong math and science background with experience in Data Base Administration and VAX Systems Programming. VAX 11-780 experience highly desirable.

For immediate consideration please forward your resume to:
Professional Placement, Ann Olson, E-Systems, Inc., Garland Division, P.O. Box 226118, Dept. 41, Dallas, Texas 75266.

An equal opportunity employer M/F, H. V. We practice and support affirmative action.

Arizona/California/Texas/Colorado/Florida/Boston
SCIENTIFIC OR BUSINESS PROGRAMMERS
All fees and relocation paid. \$20-40,000

If you have a BSEE, BSCS, BS in Mathematics or Physics or equivalent, we need you right now.
For Business: OS/DOS/IMS/CICS/MVS/JES Prog/Anal/Systems/Data Base. All large scale installations.
For Scientific: experience in the computer, communications, semiconductor, or aerospace/defense industries.
Your name, resume, and present employer will not be given out without your permission.
For sincere personal service, please send a confidential resume to:
Dan Pullman (602) 274-5660
PULLMAN PERSONNEL
3033 North Central Ave., Suite 505, Phoenix, Arizona 85012

SYSTEM CONSULTANT

Extremely challenging positions require IDMS, ADS-ONLINE, IOD. These opportunities represent the leading edge of sophisticated technologies with companies that manage growth and reward for performance.

Our clients have the most CHALLENGING and GROWTH ORIENTED career opportunities CALIFORNIA offers.
LOGICAL OPTIONS
One Market Plaza, Spear Tower, Suite #2014C
San Francisco, CA 94105 • (415) 777-3906

BANKING DP

If you possess 3+ years experience in banking on financial application in an OS/MVS environment you may qualify for a few of our select listings. We work with many of the top 100 commercial US banks. As your agent we guarantee confidentiality. We have current openings for Programmers with IMS and CICS, Senior Technical Consultants, Senior Programmer Analysts, Team Leaders, and many more.

Adkins & Associates Limited
Banking Division
P.O. Box 16062
Greensboro, NC 27406
Call: Andy Park
(919) 378-1261

EFT Opportunities
MOVE UP IN THE WORLD...
Come To Colorado.

Affiliated Banks Service Company, headquartered in Denver, can offer you the environment for career growth and satisfaction plus accessibility to all forms of recreation that make a lifestyle anything but routine.

We are currently looking for a few good people with EFT programming experience to satisfy immediate needs in our growing Electronic Banking Division. Our progressive state-of-the-art organization offers: IBM 3083, TSO/SPF, 1-to-1 CRT ratio, productivity aids, personal computers, and complete training program for selected individuals.

One of the largest on-line networks in Colorado supporting:

- ATM "Diebold"
- National debit card "Visa"
- On-line teller "Honeywell"
- National switch "PSI"
- ACH "UCC PIPS"

To qualify individuals must have 2+ years experience in COBOL, command level CICS and OS/JCL. Project leadership skills a plus.

If you are an energetic, self-starter with the above qualifications, take the first step on your "move up" by contacting us today. Send your resume complete with employment and salary history to: Personnel Department CW, AFFILIATED BANKS SERVICE COMPANY, 8461 Delaware Street, Thornton, CO 80221.

Affiliated
Banks Service Company

Equal Opportunity Employer M/F

Systems Analysts

The Department of Computing Services of the Fayetteville campus of the University of Arkansas, located in the scenic Ozark Mountains, has openings for Junior and Senior level Systems Analysts. These positions require a strong COBOL background using IBM software in a multi-processing, on-line environment, and the ability to interface with all levels of the user community. Knowledge of MSA financial systems (G/L A/P H/R) a plus. Send resume and salary history to:

Director of Computing Services
220 Administrative Services Building
155 Razorback Road
University of Arkansas
Fayetteville, Arkansas 72701
University of Arkansas is an Equal Opportunity
Affirmative Action Institution

position announcements

position announcements

position announcements

position announcements

position announcements

We've got lobsters.

What we need are data processors.

Help.

Maine has tons of lobsters and forests, lakes and mountains. What Maine could use more of are top-notch data processing professionals.

Maine is an outstanding place to live. And Unionmutual is an outstanding place to work, with excellent salaries and benefits.

State of the art

We have one of the most advanced technical environments in New England, including an IBM 3081 and an Amdahl V6 under OS/MVS. COBOL is the primary language. On-line systems utilize CICS and program development is provided through CMS.

A dynamic company

Unionmutual is one of the fastest growing life insurance organizations in the country, a Fortune 50 insurance company with over \$3 billion in assets. And for seven years, we've sold more Long Term Disability coverage than any other insurer.*

A dynamic city

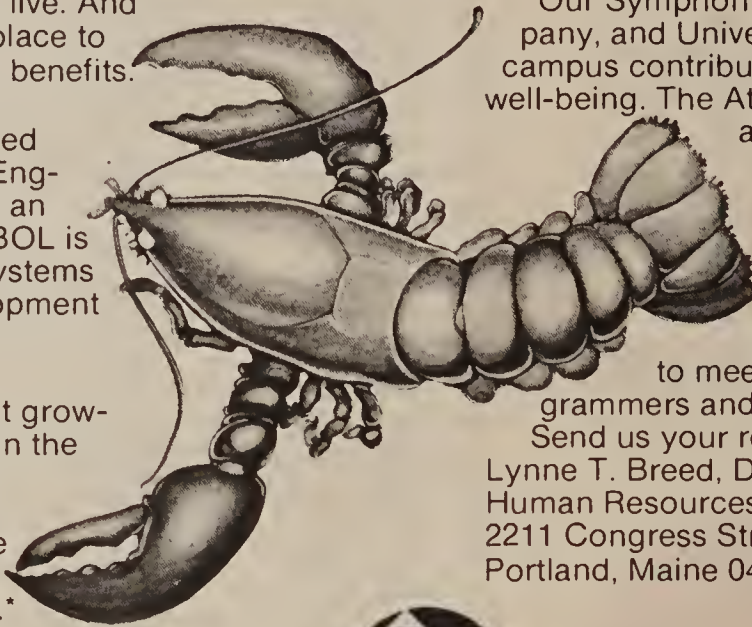
Portland, our home office location, has seen remarkable growth including a \$5 million public library, a new Art Museum Building, and the Cumberland County Civic Center.

Our Symphony, Stage Company, and University of Maine campus contribute to our cultural well-being. The Atlantic is seconds away, skiing minutes away and Boston only two hours away.

Let's talk.

We're anxious to meet crackjack programmers and systems analysts.

Send us your resume. Write to Lynne T. Breed, Dept CW-10/83 Human Resources, Unionmutual, 2211 Congress Street, Portland, Maine 04122.



Unionmutual

Putting your future in a whole new light.

An Equal Opportunity Employer

*Employee Benefit Plan Review, April 1983

DIRECTOR OF SYSTEMS PROGRAMMING BREVARD COMMUNITY COLLEGE COCOA, FLORIDA

Experience as a Systems Analyst Programmer in higher education is desirable. Familiarity with the Burroughs system and some management is a plus. Salary \$30,500. Please send resume to:

Director of Personnel
1519 Clearlake Road
Cocoa, FL 32922

Systems Programmers Olympia, Washington

Expanding shop looking for 2 motivated individuals with a minimum of 2 years experience in an IBM environment. Expertise in 1 or more of the following areas desired:

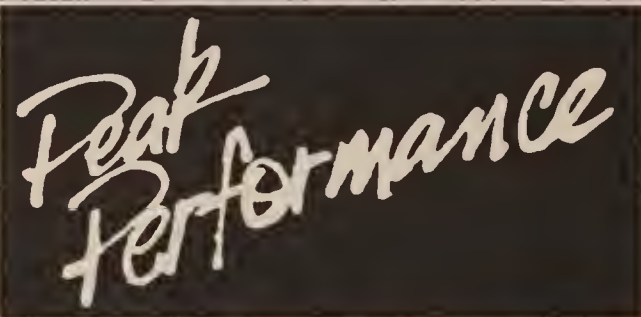
**MVS
ACF/VTAM/NCP
CICS**

Opportunities involve responsibility for systems software generation, installation, maintenance, capacity measurement/planning, and problem resolution. Salary DOQ.

Send resumes to:

Personnel Department, AFC
1206 South Quince
Olympia, Washington 98504

Data processing firm needs a programmer analyst to do programming and operations on 3 Hewlett Packard mini computer systems; including data base design, implementation and programming entire sub-systems in BASIC; also responsible for Assembly language programming on Apple IIe micro computers etc. At least BS degree in computer science, working knowledge of computer network and data base and also familiarity with Apple IIe operations required. \$18,000 a year for 40 hours per week. Apply at the Texas Employment Commission, Dallas, Texas or send resume to Texas Employment Commission, TEC Building, Austin, Texas 78778, refer to job order #2511104. Ad paid by an Equal Employment Opportunity Employer.



amdahl

How Can Operating Systems Specialists Reach Peak Performance at Amdahl?

People come first at Amdahl. Top quality people who thrive on working with the world's fastest, most reliable computers. From the beginning, Amdahl has invested time, care and effort in supporting and motivating quality people. Explore these opportunities in our Corporate Computer Center, one of the largest data centers in the country.

Manager MVS Software

You will manage five System Programmers responsible for supporting MVS, JES2 and related software running on six Amdahl V8s in the Corporate Computer Center. Your responsibilities will include personnel management, project management, user interface, planning and budgeting. One year's experience in technical management, including personnel responsibility, plus 3 years prior experience in OS/MVS system programming is required. A degree in Computer Science, or equivalent, desired.

MVS Performance and Tuning Specialist

Join our Resource Management Group, where you'll use your skills in all areas of performance management, including monitoring, measuring, configuration analysis, application analysis and operating system changes. Degree in Computer Science or equivalent desired, plus 2-4 years CPE experience, with working knowledge of SAS, Assembler and OS/MVS system internals, as well as state-of-the-art tuning techniques.

Sr. VM System Programmers

We are seeking two Sr. Systems Programmers to support VM/SP and related software running on four Amdahl V8s. If you have a minimum of 4 years VM systems programming experience, including installation, maintenance, VM internals, and sensor diagnostics skills, plus experience in Assembler language coding, you may qualify for one of these rewarding opportunities. A degree in Computer Science, or equivalent, desired.

When you join Amdahl's progressive Corporate Computer Center in Sunnyvale, California, you will enjoy these advantages reserved for the most select team in large-scale systems:

- Work in one of the largest data centers in the United States
- Leading-edge software including MVS/SP, ACF/NCP, ACF/VTAM and MSNF, VM/SP, IMS/DB/DC
- A hardware configuration that consists of one 5860 and ten 470/V8s, five 4705s, mass storage system, over 400 spindles of DASD and over 1,000 terminals
- An extensive training and education program

To explore one of these opportunities, call Bob Tyler at (408) 746-6190, or send your resume to his attention at **Amdahl Corporation, MS-300, Dept. 11-218, P.O. Box 470, Sunnyvale, California 94086**. We are an equal opportunity employer through affirmative action.

the amdahl phenomenon

FIELD ENGINEERS

Dataserv Computer Maintenance is expanding nationwide. We now have immediate openings in major cities and will be adding more in the near future.

These are key positions and provide excellent opportunities that will lead to further promotion in a fast growing company. Excellent compensation plan and good fringe benefits for experienced individuals. Your potential for personal advancement with a \$100 million plus company is the greatest right now as we expand.

We now have immediate openings in these cities for these positions:

Richmond, Virginia - FIELD ENGINEER

We have immediate opening for experienced I/O Field Engineer to maintain IBM disk and tape equipment.

Milwaukee, Wisconsin — FIELD ENGINEERS

Immediate opening for engineer with experience on IBM tapes, printers, disks, display equipment.

Dallas, Texas — FIELD ENGINEERS

Excellent position for experienced Field Engineer to work on IBM 327X equipment. We have several openings in the Dallas, Ft. Worth metro area.

Los Angeles, California — FIELD ENGINEERS

Field Engineers required for the support of IBM 3600 Banking and/or Supermarket Systems.

FIELD ENGINEER — MIDWEST LOCATION

Experienced with IBM 5525 Administrative Systems. We have an excellent opportunity and immediate opening for qualified individual.

Dataserv will soon have additional opportunities for field engineers and technical specialists in several other major cities throughout the United States. If you are considering a change in employment, contact Dataserv for a review of what we have to offer.

For immediate consideration and more information call **Toll Free — 800-328-6729** or send your resume to: **Bev Walters, Dataserv Computer Maintenance, Inc., P.O. Box 3003, Hopkins, MN 55343**. We are an equal opportunity employer and all inquiries are considered confidential.

dataserv

position announcements	position announcements	position announcements	position announcements	position announcements
------------------------	------------------------	------------------------	------------------------	------------------------

Systems Architects and Systems Software Engineers:

WIS

The Mission Begins Now!

The days of proposals and broad scale project definitions are behind us now. GTE has been selected to take on *the principal architectural role* in the information systems project of the century...WIS.

Designed to bring unprecedented, state-of-the-art capabilities to WWMCCS, the Worldwide Military Command and Control System, WIS will involve high level professionals from the broadest range of technologies and disciplines ever assembled under the aegis of a single Information Processing System program.

That's why we need advanced level systems professionals like yourself. To take on a leadership role in the development of a system so advanced you'll be working beyond existing state-of-the-art technology. In a program that's projected to be totally software-driven—the first program of its size and scope to have its software designed before any hardware is selected. And you'll work with resources that represent the best available commercial technology.

Imagine the complexity and sophistication of an Information System that provides instantaneous and secure communication links on a worldwide basis between decision-makers and field commanders. The incredible challenge of integrating many millions of lines of software into a system dedicated to redundant communication links and distributed networks on a scale never before imagined.

Long before it's completed, WIS will dramatically impact state-of-the-art in Information Processing throughout the world, for decades to come, in both military and commercial applications. The Senior Level Systems Architects and Systems Software Engineers who join us today will take a frontline leadership role in the development of WIS...and their careers will never be the same.

GTE, as a world renowned leader in the development of C³ and C³I systems technology,

has been charged with the mission of developing a system that will stand up to the toughest challenges ever conceived for an information system. A system that will lead the way for technology well into the next century.

If you would like to get in on the ground floor of the development effort for this major system breakthrough, don't put off contacting GTE today.


At GTE, the mission begins now.

If you're a Senior Level Systems Architect or Systems Software Engineer with significant experience in one of the following areas, you're ready to take a leadership role at our new facility which will be opening in the Bedford area after the first of the year.

Systems Architecture
Systems Communication
Standards
Systems Communication Software
ADA PDL
Database Management Systems
Operations Analysis
Systems Software
Security Systems
LAN Systems
Systems Test
Systems Integration

To investigate these opportunities at GTE, send your resume to Amy H. Tananbaum, GTE's Sylvania Systems Group, Strategic Systems Division, 1 Research Drive, Westborough, MA 01581. An equal opportunity employer m/f/h/v. U.S. Citizenship required.

The Forefront of C³ and C³I Technology

 **Systems**

position announcements	position announcements	position announcements	position announcements	position announcements
------------------------	------------------------	------------------------	------------------------	------------------------



**Let your
Imagination
go. It will
Bring you to
Wang.**

As the acknowledged world leader in the computer-driven Office Automation market with more than \$1.5 billion in revenues, Wang today stands #264 on the Fortune 500. And that's still only just the beginning. If you understand terms such as SNRM, SDT, PDIR, and FMH-3, and you can develop the software to support them, you'll find exceptional challenges with our system software development team.

**WANG IS INSTALLING ONE
OF THE LARGEST SNA
NETWORKS IN THE WORLD.**

SNA COMMUNICATIONS DEVELOPMENT

As a key individual contributor, the successful candidate will further the development of Wang SNA Communications by continuing the design and implementation of an SNA gateway architecture, and implementing new Wang SNA products such as communications support for applications distributed between Wang and mainframe computers. You'll integrate SNA functionality into the total Wang Systems Networking approach, enhance existing products and build SNA products for newly developed Wang hardware systems. The ideal candidate will be a senior level software engineer with a strong background in software development, from requirements definition through the completed product. Extensive experience with SNA networking, large software systems, and virtual storage computers is required. Familiarity with PL/1, PASCAL and/or C is a plus. The ability to analyze complex software systems is essential for success in this role.

Leading the way in benefits.

Wang offers one of the best benefit programs in the industry including profit sharing and stock bonus plan, long term stock option and stock purchase plans, company paid dental, medical and life insurance, tuition reimbursement, and our employee country club.

Contact us today.

Send resume with salary history to Christine Mann, M/S 1459, Wang Laboratories, Inc., One Industrial Avenue, Lowell, MA 01851.

We are an affirmative action employer.

WANG

The Office Automation Computer People

**Information Systems
Careers...**

We've been pursuing the future in electronics for more than three decades. We've called the Portland metro area home for all those years, and we've grown up to be one of the largest private employers in Oregon. Specifically, Tektronix develops, manufactures and markets internationally recognized precision electronic measurement instruments. Our divisions are all located in close proximity of one another, unifying the creative energies of finely-honed futuristic minds.

Our advanced systems environment consists of IBM (IMS, CICS, VM) and DEC (VMS, RSX11). Opportunities exist for professionals wishing to help us shape the future in Information Systems within corporate and several of our multi-plant divisions. You can qualify with at least 3 years' experience in the following disciplines:

Systems Programmers

You'll be involved in maintaining operating systems as well as evaluating systems hardware/software.

Systems Analyst

This challenge revolves around the design, development and construction of business applications systems.

**Business Applications
Programmer Analyst**

Responsibilities include performing structured design, programming and analysis duties.

Tektronix' rewards are equal to the Tektronix challenge. We begin with open salaries, and go on to include educational support, insurance, profit sharing and a realistic relocation program. These rewards are as pertinent to your future as our state-of-the-art challenges. Combined, they give your career objectives a perfect balance.

For immediate consideration, please send your resume and salary history to Ben Langston, MS Y6-010, Tektronix, Inc., P.O. Box 500, AJO, Beaverton, OR 97077.

We are an equal opportunity employer m/f/h.

Tektronix
COMMITTED TO EXCELLENCE

**Programmer/
Analyst
Salt Lake City**

EIMCO Mining Machinery International is a heavy equipment manufacturer supplying mines and construction operations with earth-moving equipment.

We have an immediate opening for a Programmer/Analyst to play a key role in bringing up our IBM System 38. This person will help fine tune our newly installed system and develop programs to meet our needs.

To qualify, you should have three to five years experience of which one to two years should be on the System 38, including System 38 Utilities and CL; a B.S. in Computer Science or Business (or comparable experience); knowledge and experience with RPG III and/or COBOL; good communication skills; and experience and ability in preparing functional specifications and documentation. Experience in a manufacturing environment is a plus, as is experience or interest in microcomputers.

If you want a challenging role with a top systems team, and if the lifestyle of the Intermountain West appeals to you, send us your resume.

Manager, Employee Relations
P.O. Box 1211
Salt Lake City, Utah 84110

Equal Opportunity Employer

A Baker International Company

**EIMCO Mining Machinery
International**

**BRYANT BUREAU
HAS THE
COMPUTER PROGRAM
FOR YOU**

If you're not accomplishing your career goals, let us put you in the right environment. Our national database of client companies are continually looking for progressive DP professionals who want to remain state of the art.

IBM Sr. Project Leader OS/MVS	to \$35K
IBM Internals Specialist OS/CICS	to \$35K
IBM P/A OS/VS1/Assembler/CICS	to \$30K
HON Software Analyst	to \$40K
HON Sys Prgm Level 6, MOD400	to \$42K
BUR 4200 EDP Director - banking	to \$50K
BUR Data Comm- strong NDUI	to \$45K
BUR Software Support Analyst	to \$50K
DEC PDP11 Sr Software Architect	to \$45K
DEC VAX VMS Ingres Systems Pgrmt	to \$35K
HP 3000 Sys Analyst image/query	to \$32K

To become part of the growth in the 80's, contact the DP Division below.

Bryant Bureau®

DP Division
4000 S. Tamiami Trail, S-512
Sarasota, FL 33581
(800) 237-9497

**THIS
SPACE
FOR
HIRE.**

[Inquire at Classified
Advertising Dept.]

**Software
Professionals**

APPLIED DATA RESEARCH, the world's oldest and largest independent systems software products company, is seeking software professionals for employment in Dallas or Princeton with experience in one or more of the following:

Software Development

- IBM systems software development using IBM Assembler and Macro Language
- Personal/Micro Computer software development using 'C' language
- Data Base/Data Communications software development

Software Support

- Systems software positions available for both intermediate and senior level personnel in software product support.

For confidential consideration send a resume, including salary requirements, to Mr. E.D. Smith, Director of Technical Recruiting, APPLIED DATA RESEARCH, INC., Route 206 & Orchard Rd., CN-8, Princeton, NJ 08540.



**APPLIED
DATA
RESEARCH**

An equal opportunity employer

position announcements

position announcements

position announcements

position announcements

position announcements

CHOOSING THE RIGHT SOFTWARE COMPANY



It's hard to look smart when you make a dumb decision.

Choosing the wrong software company to work for can be a hard fact to face up to.

We'd like to help you save face. We're Computer Corporation of America. The braintrust that brought forth the **MODEL 204** DBMS. Recently rated #1 overall in a Datapro survey, **MODEL 204** is recognized today as the most powerful and fastest growing DBMS for IBM mainframes.

Recognize what we're saying. This level of professional acclaim and commercial success is the direct result of serious efforts on the part of advanced research and astute marketing sensibility. One without the other simply won't do.

Hard-nosed, self-serving rhetoric? Perhaps. But face it. It's silly to work anywhere else.

BRANCH MANAGER/SR. SALES REPRESENTATIVES

Responsibilities: Sell **Model 204** and other CCA systems in designated territories; track leads, identify and qualify prospects; develop sales strategies; monitor and report sales progress; close sales; perform account administration and follow-up.

Qualifications: 3-5 years' experience selling computer software systems; solid understanding of IBM environment and marketplace; DBMS experience desired.

Positions available in the following branch offices: Connecticut; New Jersey; Rochester; Pittsburgh; Washington, DC; Detroit; Houston; Los Angeles.

SR. TECHNICAL CONSULTANTS

Responsibilities: Pre- and post-sale support for **Model 204** DBMS within our Federal Systems Group; pre-sales presentations; analysis of user requirements, benchmarks, customer training and installation.

Qualifications: Solid experience in IBM systems/applications software with emphasis on operating systems, database and teleprocessing.

Positions available in New England; Connecticut; New York City; New Jersey; Washington, DC; Rochester; Pittsburgh; Chicago; Dallas; Los Angeles; San Francisco.

INTERNATIONAL SALES

Responsibilities: Sales and marketing support for **Model 204** international affiliates. Prepare and implement sales and marketing strategies; monitor and report sales progress; coordinate technical consultant support efforts and develop new affiliate relationships.

Qualifications: Minimum 3 years' experience selling systems software in an IBM environment, preferably in the international marketplace.

INTERNATIONAL TECHNICAL CONSULTANT

Responsibilities: Pre- and post-sale support for **Model 204** DBMS; pre-sales presentations; analysis of user requirements, benchmarks, customer training and installation.

Qualifications: Solid experience in IBM systems/applications software with emphasis in operating systems, database and teleprocessing.

Positions involve international travel including Japan, Australia and Europe.

MANAGER

Educational Services

Responsibilities: Complete responsibility for all aspects of customer education including budgetary and personnel concerns; plan, coordinate and control coursework development, materials preparation and distribution and class offerings in CCA Education Centers and at customer sites.

Qualifications: Management, course development and teaching experience; knowledge of instructional techniques and presentation skills; knowledge of IBM mainframe systems and DBMS experience preferred.

Positions available in Cambridge, MA and Denver.

EDUCATIONAL SPECIALISTS

Responsibilities: Conduct **Model 204** education classes in CCA Education Center or on-site customer locations; assist in development of course material; provide hot line and on-site technical support to customers; assist in contract consulting/programming.

Qualifications: Teaching experience; knowledge of IBM systems - JCL; programming languages - COBOL, PL/1, BAL, Fortran. DBMS, CICS, PP, Monitors experience desirable.

Positions available in Denver and Washington, DC.

(SR.) COURSE DEVELOPMENT SPECIALIST

Responsibilities: Plan, design, produce and maintain customer classes covering all aspects of **Model 204** DBMS and related CCA products including class handouts, video presentation materials and teachers' notes.

Qualifications: Course development experience highly desirable; knowledge of IBM mainframe environments, on-line systems, DBMS and **Model 204** desirable.

Position available in Cambridge, MA.

Look smart. Look here.

Send your resume, specifying position of interest and geographic preference, to David Levine, Department CW1114-83, Computer Corporation of America, 4 Cambridge Center, Cambridge, MA 02142. Or call (617) 492-8860, Ext. 529.

An equal opportunity employer M/F

Computer Corporation of America

position announcements

position announcements

position announcements

position announcements

position announcements

Memphis, Tennessee



Growth Opportunities For Data Processing Professionals

Holiday Inns, Inc. is shaping the future of the hospitality industry. Due to our continued success, we have on-going and immediate needs for dynamic professionals in the following areas:

HOLIDEX APPLICATIONS

SYSTEMS ANALYST
4-5 years experience

PROGRAMMER ANALYST
2-3 years experience

PROGRAMMER
2 years experience

These individuals must have experience using Assembler Language with a good working knowledge in real-time programming and systems analysis in a large scale teleprocessing environment.

DECISION SUPPORT

OPERATIONS ANALYST—Position involves building operations research, statistical, financial and simulation models. Applicants must possess strong written and verbal communications skills to provide analytical and computer support to management. Must have solid operations research, mathematics, statistics, finance and computer language background with familiarity with DEC20 computer, and have knowledge of FORTRAN, SAS, SPSS, DPL and EMPIRE. BS in Computer Science or related area required; MS or MBA or one year related experience a plus.

TIMESHARING PROGRAMMER ANALYST—Will prepare system requirements, design computer systems, and perform program maintenance for the DEC Timesharing System. In addition to strong written and verbal communications skills, must have 2 years experience in programming on a timesharing/on-line system plus capabilities of a Systems Analyst. BS in Computer Science required; MS preferred.

ACP TECHNICAL SUPPORT

ACP/TPF SENIOR SYSTEMS PROGRAMMER—Requires an individual with at least 5 years systems and programming development experience, of which a minimum of 3 years must be in ACP/TPF systems internals. Requires an in-depth knowledge of the ACP/TPF control program and associated facilities. Should have a thorough knowledge of ACP/TPF communications, Data Base support and system performance. VM/MVS/TSO also required.

SYSTEMS DEVELOPMENT

PROGRAMMER—1-2 years experience and proficiency in COBOL.

PROGRAMMER ANALYSTS—3-5 years experience including systems analysis; proficiency in COBOL and either Data Base or CICS applications.

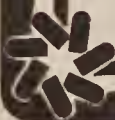
SENIOR PROGRAMMER ANALYST—Minimum of 5 years experience including systems analysis, system design, COBOL, CICS and Data Base applications; and project leadership.

In addition, these positions required experience in a large-scale mainframe environment. Experience with structured methodology, on-line programming, Data Base or micro-computers would be an asset. Knowledge of IBM mainframes, OS JCL and TSO/SPF would be helpful. BS in Accounting, Business or Computer Science desirable.

The Memphis area affords a moderate cost-of-living, mild but seasonal climate and a vast array of cultural and recreational activities. Our worldwide headquarters provides a working environment conducive to personal and professional growth and achievement.

We offer excellent compensation, competitive employee benefit packages and an educational assistance plan. If qualified and interested, send your resume in strict confidence to: **HOLIDAY INNS, INC.**

— Recruiting & Selection/JG, 3796 Lamar Avenue, Memphis, Tennessee 38195



Holiday Inn®

An Equal Opportunity Employer M/F/H.

Join A Team On The Leading Edge Of Technology

Utilizing PDP 11s, M-68000s, and 32-bit "SUPER" Minis with UNIX*

Computer Consoles, Inc. designs, develops, manufactures, markets, and services a variety of mini computer-based application-oriented file management systems. We're one of the fastest growing companies in the computer field and the leader in the development of **fault-tolerant** data management systems. Located in Rochester, NY, a community approaching the one million population mark, we offer outstanding educational and health care facilities as well as superb recreational, cultural and entertainment activities.

CCI currently has immediate opportunities for: GROUP LEADERS/SOFTWARE ENGINEERS

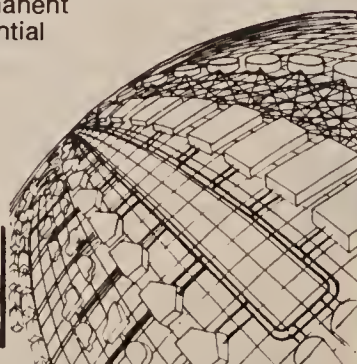
You will be responsible for the design and implementation of data base applications and utilities; or fault tolerant operating system development including development of multiprocessor UNIX* — compatible transaction processing system.

We prefer a Technical Degree plus a minimum of 2 years experience. Knowledge of C, UNIX*, and data structures plus experience with data bases in minicomputer realtime or online environment and/or OS internals.

We offer challenging assignments, opportunities for growth, attractive compensation and a benefits package that includes dental and profit sharing plans. Must be U.S. citizen or permanent resident. Please send your confidential resume including salary history to:

CCI COMPUTER CONSOLES INCORPORATED®
C.W. Tetley
COMPUTER CONSOLES, INC.
97 Humboldt Street
Rochester, NY 14609

*UNIX is a trademark of Bell Laboratories
We are an equal opportunity employer m/f



300 DP Openings

Electronic Warfare Software Engr (2 yrs)	25 40K
Mfg Prog/Anal (2 yrs Mfg Apps, IMS or CICS)	25 35K
ACP/PARS Prog/Anal, Sys Anal (2 yrs ACP/PARS)	25 40K
Bank Prog/Anal (2 yrs Bank Apps, IBM 370 or BURR)	20 29K
Bank Sys Anal (3 yrs IMS, CICS or HOGAN)	28 36K
Insurance Prog/Anal (2 yrs MVS, CICS)	21 28K
Prog/Anal (2 yrs UNI 1100, DMS 1100)	23 32K
Prog/Anal (2 yrs IMS, CICS or IDMS)	25 35K
Prog/Anal (2 yrs HONEY 66, IDS II, DM IV-TP)	25 34K
Prog/Anal (2 yrs HP 3000)	25 30K
Sys Anal (3 yrs IMS, CICS or IDMS)	28 39K
Sys Prog (2 yrs OS or DOS/VSE)	25 39K
Sys Prog (2 yrs IMS, CICS or IDMS)	27 40K
Comm Sys Prog (2 yrs VTAM, NCP, SNA)	27 40K
DEC Sys Prog (2 yrs PDP II or VAX)	25 40K
DEC Software Engr (2 yrs PDP II or VAX)	25 35K
Software Engr (2 yrs Z80, 8080, 6800)	25 40K
Software Engr (2 yrs UNIX, "C")	25 35K
EDP Auditor (2 yrs EDP Audit, IBM 370)	24 33K
Data Base Anal (2 yrs IMS)	35 45K

#1 employment agency, #1 DP employment consultant for 1982 in IPA (150 agencies, 500 consultants), now #1 agency in NPC (100 agencies, 400 consultants). Fee paid.

Rick Young, CPC (704) 366-1800
Corporate Personnel Consultants, Inc.
3705 Latrobe Drive, Suite 310
Charlotte, N.C. 28211

SUNBELT OPPORTUNITIES

Prog. Anal.	to \$29,000 SC Location
(3 years ins. appl, COBOL and IMS)	
Prog. Anal.	to \$30,000 NC Location
(3 years mfg, appl, CICS and COBOL)	
Prog. Anal.	to \$29,000 NC Location
(3 years banking, IMS and COBOL)	
HP Prog. Anal.	to \$28,000 NC Location
(Min 2 years COBOL and IMAGE)	
DEC Prog. Anal.	to \$28,000 VA Location
(11/70 RSX-11M COBOL and Degree)	
MVS Sys. Prog.	to \$38,000 NC Location
(3-5 years gens, maint. & tuning)	
VM Sys. Prog.	to \$38,000 NC Location
(3 plus years Fortune 100 Co.)	
Mfg. Sys. Anal.	to \$35,000 TN Location
(3 years mfg. design)	

For a clear understanding of our clients needs, call Robert Montgomery at (919) 872-2940.

FOX-MORRIS
Personnel Consultants
Since 1962
3101 Poplarwood Court
Raleigh, NC 27625

Senior MVS Systems Programmer

At National Semiconductor, strong demand in all product areas plus outstanding financial strength means we're well positioned for growth throughout the 80's.

We are currently seeking a highly motivated, results-oriented MVS systems programmer to join our large IBM-plug compatible mainframe environment. You will maintain MVS operating systems as well as install and maintain program products. A BS in CS, or equivalent, plus at least five years of experience and background with CICS, TSO, IDMS and MVS/SP is essential.

If you qualify, send your resume to National Semiconductor, Dept. LR, P.O. Box 62499, Sunnyvale, CA 94088. We are an equal opportunity affirmative action employer. Principals only please.

Let's talk about your career.



National Semiconductor

Management Information Systems Director AMPEX CORPORATION

Large multi-national, multi-division manufacturing company located on the San Francisco Peninsula is seeking a seasoned MIS executive to take charge of its computing and systems resources. AMPEX is a world leader in the development of magnetic storage technology, video systems and recording, and utilizes a combination of IBM and Hewlett-Packard computers in a world-wide information network.

Candidates should have a minimum of 10 years of progressively responsible positions in MIS with at least 5 years in a director level position and be familiar with IBM's MVS/SP and DOS/VSE operating systems along with TSO/SPF, CICS, IMS/DB program products, as well as with the HP-3000 MPE IV operating system and IMAGE, VIEW/3000 products.

Candidate must have excellent communication skills; working knowledge of Business System Planning; strong manufacturing systems background along with other business systems such as Marketing, Engineering and Finance. MBA preferred.

Ampex offers a very competitive compensation package commensurate with experience and an attractive benefits program.

Send your resume including present compensation to: **Will A. Wedel, Vice President Industrial Relations, MS 2-16, 401 Broadway, Redwood City, CA 94063.** An equal opportunity employer.

AMPEX

Ampex Corporation • One of The Signal Companies

DEBUG your search
for the "pros" with...
**Position
Announcements**

position announcements

position announcements

position announcements

position announcements

position announcements

CALLING YOU INTO THE 21ST CENTURY.

Pacific Telephone is leading the way into the Information Age! Now you can be among the first to work in our exciting, new state-of-the-art center in San Diego.

STAFF ANALYST

As an integral part of our timesharing organization, you will be responsible for systems software maintenance, systems gens and performance. You will also be involved with programming and some assembler utility routines. You will qualify if you have 2-3 years' VM/CMS systems programming experience. A BS or Computer Science degree would make you especially competitive as would strong oral/analytical communication skills. This job may require some overtime and travel. One major highlight of this position is that you will have the professional freedom to work in an unsupervised, unstructured environment. Salaries for this position can range from high 20's to high 30's (depending on qualifications) and our benefits are outstanding.

Turn your future into an exciting place to be by sending your resume to **PACIFIC TELEPHONE, Management Employment, 1001 Wilshire Blvd., Suite 200, Dept. EG-697, Los Angeles, CA 90017.** Relocation not provided. No agencies, please. We are an equal opportunity employer.



Pacific Telephone

GATEWAY TO THE WEST - THE GREAT PLAINS SYSTEMS ANALYSTS

(17 Needed)

2 - 5 years large frame IBM environment insurance or financial applications. Our client is one of the world's largest life insurance companies located in a mid-size metro area. If you want freedom to develop your style, you need to look at this. In confidence send your resume and salary history or call: **JOAN OR CHUCK DUMMER**

Dunhill

of KEARNEY, INC.
3720 Ave. A Suite B
Kearney, NE 68847
(Call Collect) (308) 234-4555

Systems Programmer

The Department of Computing Services of the Fayetteville campus of the University of Arkansas, located in the scenic Ozark Mountains, has an opening for a Senior Level Systems Programmer. This position requires a strong background in the IBM System/370 Assembly language, with experience in the VM/SP, CMS, VS1, CICS, and/or MUSIC systems. Knowledge of IBM's procedures for installing and maintaining these systems is a plus. Send resume and salary history to:

**Director of Computing Services
220 Administrative Services Building
155 Razorback Road
University of Arkansas
Fayetteville, Arkansas 72701**
*The University of Arkansas is an Equal Opportunity
Affirmative Action Institution*

Personal computer users:

FOR FREE ACCESS TO A BETTER JOB CALL CLEO.

(213) 618-8800 (408) 294-2000
(415) 482-1550 (714) 476-8800
(619) 224-8800
Standard ASCII code
Access assistance
(213) 618-1525

CLEO

Computer Listings of Employment Opportunities

ROMAC FLORIDA

MEET THE CHALLENGE

Florida's tremendous growth has created unique opportunities in state of the art environments for motivated, skilled data processing professionals.

PROGRAMMERS, ANALYSTS, SOFTWARE ENGINEERS, SYSTEMS PROGRAMMERS

UNLOCK YOUR POTENTIAL

Romac & Associates of Florida, Inc.

One Tampa City Center, 800 W. Cypress Creek Rd., Ste. 305-C
Ste. 2360-C, Tampa, FL 33602 Ft. Lauderdale, FL 33309
(813) 228-6327 (305) 928-0811

Computer Software Engineers/
Systems Programmers

Kearfott momentum.
Propelling advances in software...
and in careers.



Software professionals who set their sights high will find Kearfott an ideal environment for wider career latitude and exposure to new and developing technologies. In operating systems...commercial applications...and computer software engineering. Right now we're involved in some of the most stimulating projects which depend on strategic software advances in communications, logistics, MIS, and guidance systems.

Join an elite operating systems software group at our Data Center, one of the country's most sophisticated information processing centers, where state-of-the-art innovations are the norm. You'll be maintaining IBM and Amdahl mainframe computers with supporting software that includes MVS/SP3, JES2, IMS DB/DC, CICS, WYLBUR, TSO ACF/VTAM, GDDM, and numerous compilers and program products. Via advanced communication links, this Center is tied into all our plants, and you'll be equipped for an instant interchange of technical data. And have the opportunity to support user-friendly software and microcomputers, become involved with educating company users, and consult on, and resolve, daily problems.

Underlying Kearfott's ability to maintain technical leadership is a solid MIS base whose software applications include accounting, finance, payroll, inventory, and manufac-

turing controls. In MIS, you'll be part of a team involved in COBOL programming, CICS, MVS, IMS, data base design, and telecommunications.

The challenges in software engineering at Kearfott are ongoing with a broad technological scope: realtime software development...simulation or validation techniques...firmware and microprocessors...Kalman filtering...Fortran, JOVIAL or ADA compilers. If you have strengths in these areas, let us tell you about the diversity of our minicomputer projects and resources.

If you have a minimum of 3 years experience in a large-scale IBM system, with HP, DEC, or airborne minicomputers or microcomputers in realtime military systems, begin your rewarding career path now with Kearfott. Find out why software professionals can aim high here by sending your resume to: E.J. Murphy, Singer Company, Kearfott Division, 1150 McBride Avenue, Little Falls, NJ 07424.

Kearfott

a division of The SINGER Company

An equal opportunity employer, m/f, who creates opportunities

position announcements

position announcements

position announcements

position announcements

position announcements

OFFICE AUTOMATION/ INFORMATION PLANNING EXPERT

The National Cancer Institute (NCI), National Institutes of Health, Public Health Service, is seeking a professional to establish an organizational unit to provide planning, developmental, and management support to the Office of the Director and the five operating divisions in the area of office automation and information planning (OA/IP). The Institute is the lead Federal agency in cancer research and is responsible for coordinating the National Cancer Program. Its mandate includes both basic and applied research programs related to the understanding of the causes of cancer, and improvements in detection, diagnosis, treatment, and rehabilitation.

The objective of this effort is to improve the efficiency and the effectiveness of Institute operating systems. With a budget of approximately 1 billion dollars, the Institute reflects a complex management system with the possibility of major gains in efficiency by appropriately incorporating current and projected advances in office automation. The incumbent will be responsible for the initial staffing of the unit with Federal employees.

Applicants should have formal training in information management, computer science, engineering, management, or operations research as well as experience in OA systems design and selection, experience and training in data communications technology and application of OA technology (hardware and software). Experience in local area networks, federal procurement regulations and project management is desirable.

Qualifications:

Requirements: Formal training should include a BA in one of the following areas and at least 1 year of training in a second area

listed: information management, computer science, engineering, management science, and operations research.

At least five years total recent "hands on" experience in the following two areas is required:

- systems analysis, design, and selection for information or OA systems
- OA technology applications including hardware, software, and data communications aspects

Experience in local area networks, federal procurement regulations and project management is desirable.

The position of Expert has a duration of 2 years. The salary range will be \$48,553—\$63,115 depending on the expertise and experience of the individual selected for the position. The applicant selected will be covered by Civil Service Retirement and will be eligible for life insurance and health benefits.

The position is located at the NIH Campus in Bethesda, Maryland.

NIH is an equal opportunity employer.

Interested persons should submit a SF-171 (Personal Qualifications Statement) by January 3 to:

Ms. Valerie Berlew
Personnel Management Branch
National Cancer Institute
Building 31, Room 3A23, 9000 Rockville Pike
Bethesda, Maryland 20205

If additional information is needed, please call Ms. Berlew at 301/496-6864.

HIGH TECH CAREERS WITH FAIRCHILD WESTON IN FLORIDA!

Fairchild Weston, for 30 years the industry leader in EMR Telemetry, Signal Processing, Data Acquisition and Data Recording Systems has exciting career opportunities for individual with experience in Engineering and/or Computer Sciences. These positions are available due to steady sales growth as a result of our technological excellence and innovation. U.S. Citizenship required.

SOFTWARE SPECIALISTS

Positions require experience in the design and implementation of large scale real-time systems utilizing structured methodology. Experience with PDP-11, VAX-11, RSX-11M or VMS operating systems and assembly language/FORTRAN required. Knowledge of signal processing, graphics, data base implementation or large scale netted computer systems is highly desirable. Project leader position requires prior experience with proposal generation and cost estimating.

SR. SUPPORT PROGRAMMER ANALYST

An exceptional opportunity for the seasoned Programmer Analyst who desires extensive customer contact in both system enhancement and marketing support. Must be able to interface well with customers and engineering staff. Tasks involve requirements definition, installation and modification of system software in Sarasota and customer sites. Travel requirements 50%. Experience with PDP-11, VAX-11, VMS, RSX and/or RT-11 required. Knowledge of Assembly, FORTRAN and PASCAL a plus.

Fairchild Weston offers top compensation, liberal fringe benefits, relocation assistance, and a casual but challenging work environment.

Sarasota is a beautiful beach community on Florida's Gulf Coast. Sarasota enjoys a respected school system, attractive residential communities, a low tax structure, no state income tax, and a year 'round recreational climate. Please forward your resume including salary history to: Tom Salmon, Manager, Professional Employment.



**FAIRCHILD WESTON
SYSTEMS INC.**
Excellence in Defense Systems Technology... Worldwide

P.O. Box 3041, Sarasota, Florida 33578
An Equal Opportunity Employer



WE ARE CURRENTLY SCHEDULING
ON SITE
INTERVIEWS

In
Buffalo/Rochester • Cleveland/
Akron - Detroit • Chicago •
Toledo • Youngstown/Pittsburgh •
Gary • Hartford • Boston • NYC •
Philadelphia • Washington/Baltimore •
Atlanta • Birmingham • Miami • Houston/
Galveston • Los Angeles • San Francisco

CALL US TODAY TO DISCUSS YOUR SOUTHEASTERN CAREER
POTENTIAL AND SCHEDULE A PERSONAL INTERVIEW IN YOUR CITY.
TOLL FREE 1-800-438-1056

OUR CLIENTS are the leading NATIONAL and INTERNATIONAL corporations with major DATA PROCESSING CENTERS in NC, SC, So. VA., No. GA. They offer "state of the art" Technology, excellent WORKING CONDITIONS, outstanding FRINGE BENEFITS and nationally COMPETITIVE SALARIES. Many positions are eligible for equity home purchases and closing cost reimbursement. THE SOUTHEASTERN METRO AREAS — which we serve — are characterized by: A REASONABLE COST OF LIVING — at or below the national average; AFFORDABLE HOUSING — below the national average; AN ENJOYABLE MODE OF LIFE — population density is sufficient to support excellent shopping facilities, cultural and recreational opportunities and quality educational systems without the congestion, pollution and crime you may be experiencing; OUTSTANDING CAREER OPPORTUNITIES — recognizing the attractiveness of living in the Southeast, a growing number of Major Corporations relocate their data centers to this area each year; AN AGREEABLE CLIMATE — four very definite seasons each year with long pleasant Springs (March-June) and Falls (Sept.-Dec.) with short summers and winters; although we see snow every winter, it doesn't last long. And best of all THE NATIVES ARE FRIENDLY.

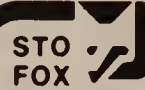
WE ARE SEEKING THE BEST QUALIFIED EXPERIENCED PROFESSIONALS AVAILABLE FOR SPECIFIC RECRUITING ASSIGNMENTS WHICH REQUIRE SPECIFIC QUALIFICATIONS.

TECHNICAL	APPLICATIONS
<p>CAPACITY PLANNER to \$45K Min. 2 yrs. Capacity Planning exp. in large mainframe IBM multi CPU's MVS/IMS/CICS environment. Applications Requirements Planning.</p> <p>SR. SYSTEMS PROGRAMMER to \$40K Min. 4 yrs. Operating Systems generation, maintenance and tuning with min. 2 yrs. VM.</p> <p>SR. SYSTEMS PROGRAMMER to \$40K Min. 4 yrs. Systems generation with min. 2 yrs. MVS Performance monitoring & tuning.</p> <p>SR. SYSTEMS PROGRAMMER to \$40K Min. 4 yrs. Software Support with min. 2 yrs. SNA, IBM 3705's, NCP, ACF/VTAM.</p> <p>SR. SYSTEMS PROGRAMMER to \$40K Min. 2 yrs. Exp. in the generation, maintenance & tuning of RSX-11M+, DECNET a plus.</p> <p>SR. SYSTEMS PROGRAMMER to \$40K Min. 3 yrs. IBM host based Distributed Systems with Min. 1 yr. in the generation, maintenance & tuning of DPPX Operating System</p>	<p>SR. SYSTEMS ANALYST to \$40K Min. 2 yrs. exp. in the analysis and design of shared logic OFFICE AUTOMATION SYSTEMS. Exp. with IBM 8100's, DISPLAYWRITER, P.C.'s, Electronic Mail and/or Communications are a plus.</p> <p>SYSTEMS ANALYST to \$35K Min. 4 yrs. exp. in the analysis & design of data processing systems with project involvement, user interface, analytical ability & verbal & written communications skills. Capability of understanding, evaluating & solving equipment problems in the OFFICE AUTOMATION AREA.</p> <p>ANALYST/PROGRAMMER to \$36K Min. 3 yrs. Analysis, Design Development & Programming & Implementation of business systems in a large mainframe IBM OS/MVS environment. Proficiency in COBOL OS/MVS - JCL & IMS DB/DC required SAS, TSO/SPF experience and a college degree a plus.</p>

WE ARE PROFESSIONAL RECRUITERS. Our function is to identify, Quantify, Quality, and Refer candidates for specific positions within our company clients' organizations. We serve as a BROKER in the truest sense of the word (i.e. represent both parties with the objective of reaching an agreement which is satisfactory to both) throughout the Interview, Offer, and Acceptance Process. We only recruit for companies who have agreed in advance to assume the responsibility for our fees and your interview and relocation expenses.

WE PRACTICE AFFIRMATIVE ACTION

Call Toll Free 1-800-438-1056 (in N.C. 919-378-9894) or write giving us your current salary; career, salary & geographic objectives & a complete current chronological resume or work history (handwritten updates or drafts are fine). U.S. CITIZENS & PERMANENT RESIDENTS ONLY
personnel consultants P.O. BOX 6788 • GREENSBORO, N.C. 27405



REAL-TIME SOFTWARE ENGINEERS

TANO CORPORATION, a leader in the design and manufacture of computer-based automation control systems, seeks career-oriented individuals to fill immediate openings:

SR SYSTEMS/SYSTEMS SPECIALISTS

Responsibilities involve in design, documentation and implementation of distributed microprocessor systems for real-time monitoring and control. Experience with Ada, Motorola 68000, and distributed processing is a definite plus.

SR PROGRAMMERS

Candidates must possess relevant degree and real-time software; Fortran and/or Assembler experience in an RSX-11M or VAX environment in the area of process or supervisory control, or energy management.

USER SERVICES/SYSTEM SUPPORT PROGRAMMERS/ANALYSTS

Responsibilities include providing a full spectrum of services to corporate users to achieve "user" systems development, data analysis and education involving system/supporting tools (DATATRIEVE). Must possess a degree in Computer Science or equivalent experience. VAX experience a necessity.

TANO CORPORATION offers an excellent compensation and benefit package, including 100% company paid medical insurance, incentive plan and pension trust. Please telephone or submit confidential resume, to:

Professional Recruitment
1-800-824-0385

TANO
CORPORATION

4301 Poche Court West, New Orleans, Louisiana 70129
Principals Only Equal Opportunity Employer

RESULTS

Whether you're buying, selling, swapping, hiring or looking, you get results from Computerworld classifieds. Maybe that's why Computerworld gets more classified advertising than all the other computer publications put together!

Computerworld
P.O. Box 880
Framingham, MA 01701
(617) 879-0700.
(800) 343-6474

position announcements	position announcements	position announcements	position announcements	position announcements
------------------------	------------------------	------------------------	------------------------	------------------------

Field Engineers

Leading national company for third party maintenance is currently recruiting for field engineers. Well rounded experience in maintaining varied computer systems necessary. Top salary and benefits. Call Mr. Lynch:

20th Century Computer Maintenance, Inc.
800-821-6151

SYSTEMS ANALYSTS AND PROGRAMMERS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Every day new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Reichle, CPC, Data Processing Specialist.

Dunhill

OF CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28226
800-438-2012
(NC Call)
(704) 542-0312

GOLDATABASE DISTRIBUTORSHIPS AVAILABLE

GOLDATA Computer Services, Inc. is pleased to offer non-exclusive distributor licenses to market GOLDATABASE, the database management system for users of IBM-PC and Apple II+/Ile.


Distributors may market GOLDATABASE either as is or as part of a system. Successful applicants will be supplied with sales literature, hot-line support, and applications using GOLDATABASE.

Interested?
Send your written response to:
Distributorships
GOLDATA
Computer Services, Inc.
2 Bryn Mawr Avenue
Bryn Mawr, PA 19010
or call us at (215) 525-1036

UNIX In Denver

Analysts International Corporation is a national consulting firm. We are presently expanding our Denver office and seeking experienced data processing professionals for the design and the development of state of the art Unix based systems. If you possess over two years experience with Unix and C in system software design or application development or Unix system administration send your resume to:

Analysts International Corporation
Gary Mosley
(303) 790-2860
14 Inverness Drive East
Building G
Suite 220
Englewood, CO 80112




For data processing brain-power think of EDPeople, a service of Robert Half.

Intelligent machines need intelligent people. And Robert Half has been finding these people since the computer revolution began.

We know the job market, and we know the right people to meet your EDP requirements.

Call any of Robert Half's 80 offices in the United States, Canada and Great Britain. We'd like to help you hire smart.



ROBERT HALF®
edp and financial personnel specialists.

© 1983 Robert Half International Inc. All offices independently owned and operated

Data Base

Experienced Data Base Professionals are needed to perform data base administration and support activities for integrated, data driven applications. We have recently received funding for a 7 year development plan for new DBMS applications, sequenced for implementation by data availability criteria. Our DBMS software includes IDMS-DB/DC/UCF, IDD, ADS/O, CUL-PRIT, OLQ, and IDMS tool kit. Full range of benefits includes substantial tuition discounts for you and your dependents at one of the leading universities in the Southeast, 22 paid vacation days after 1 year of employment, and relocation assistance. Minimum qualifications are applications or systems programming background, data base or data dictionary administration experience supporting IDMS in on-line environment, expertise in OS or MVS JCL and Utilities, and enthusiasm for challenging, rewarding assignments. Send resume and salary history in confidence to:

University of Miami
Information Systems
P.O. Box 248011
Coral Gables, Florida 33124
An Equal Opportunity/Affirmative Action Employer



CALIF. & IDMS

+ Openings in IMS DB/DC, FOCUS and ADABAS/ NATURAL.
(714) 891-1244

CPU COMPUTER PROFESSIONALS UNLIMITED, agency
7441 Garden Grove Blvd.
Ste. G, Garden Grove, CA 92641


Systems Programmer

From a state-of-the-art environment, to many diversified projects...
...you'll find it all at Falcon Jet.

But that's only the beginning! We have established ourselves as one of the leaders in the business jet industry. Our reputation gives us the opportunity to give you large company advantages with a small company atmosphere. Join the Falcon Jet team!

Working in our current IBM 4341 DOS/VSE, VM and CICS environment (converting to MVS in the near future), you will be responsible for the installation, operation and troubleshooting of our current system software. We require a minimum of 2 years' systems programming experience. Exposure to VTAM and NCP would be a plus.

We offer a competitive salary, a comprehensive benefits program and a professional environment. Please forward your resume, stating salary history/requirements, to: Personnel Department, Falcon Jet Corporation, 777 Terrace Avenue, Heights Plaza Building, Hasbrouck Heights, NJ 07604. We are an equal opportunity employer.



Falcon Jet
for a career & a future

UNIX

National Registry of UNIX job openings and UNIX Professionals
P.O. Box 19949
Dept. CW
Houston, TX 77224
Please send resumes.
Scientific Placement, Inc.

D.P. Contractors GET EXPERT TREATMENT

Top Rates • Bonuses

Talk with us about the benefits of being an EXPERT in the field of CONTRACTING/CONSULTING. We will review with you the range of challenging and high paying assignments available in New England, throughout the U.S. and Overseas. Call (617) 237-1777.



the EXPERTS
11 River Street, Wellesley, MA 02181

INFORMATION SYSTEMS PROGRAMMER

The candidate should have degree in Computer Science. (M.S. Preferred). Experience in IBM OS/VS, OS/MVS or other mainframe environment required. Must have knowledge in the areas of data base design, schema development and language interface processors, micro computers and networking. Salary: open.

TECHNOCRATS NORTH AMERICA
5120 F.M. 1960 West
Houston, Texas 77069

position announcements

position announcements

position announcements

position announcements

position announcements

H-E-B
 FOODS • DRUGS

WHAT'S GROWING IN THE SUNBELT?

Data Base Analyst Opportunities with H.E.B.

As an experienced Data Base Analyst, you know that your success depends upon your energy, creativity and innovation. But your long-term career growth depends on more than that. To develop professionally, you also need a company that is growing, building and progressing.

H.E.B. Grocery Company is a billion dollar food/drug chain with over 150 stores in Texas. We're one of the fastest growing food/drug chains in the country, with a management team that has been described as one of the most progressive in the food industry! Our Data Processing department is one of the most sophisticated in the retail field. We offer a high-tech environment, challenging work assignments and a substantial opportunity for personal development. Our continuing expansion has created an immediate need for a Data Base Analyst for our company headquarters in **Corpus Christi, Texas**. Qualified candidates must possess a Bachelors degree and 3+ years experience in data processing. Previous experience in Data Base Analysis and Data Base Design (IMS/VS) is required.

H.E.B. provides highly competitive salaries and top flight benefits, including a liberal relocation package, a profit incentive plan and the warm, sunny climate of South Texas.

For prompt consideration, please call COLLECT between 8 am - 5 pm (CST), or send your resume in strictest confidence to: **Lori Morris, Corporate Manager of Staffing, H.E. BUTT GROCERY COMPANY, P.O. Box 18020, San Antonio, Texas 78218-0200, (512) 662-5221.**

We are an Equal Opportunity Employer.



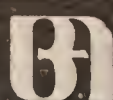
IMS Systems Programmers

Move up to the leader

You'll join an outstanding team of IMS Systems Programmers, providing data systems services such as internal support, release installation, performance analysis, DB installation and recovery, operations training and troubleshooting in either our San Francisco or Los Angeles data center. There's also data systems software and utility development plus a chance to participate in early support programs with new software products. You'll work with state-of-the-art products such as IMS FASTPATH, MSC, ACF/VTAM and ACF/NCP in this high performance environment.

A minimum of 2 plus years' experience with IMS DB/DC, MVS/JES3, VTAM, VSAM, and SMP is required as well as Assembler language skills.

Bank of America offers an outstanding salary and benefits package designed to attract and maintain top professionals. Send your resume to: **Gwendolyn Gomez, Bank of America, Management Recruitment, Dept. 3442-1114A, P.O. Box 37000, San Francisco, CA 94137.** An equal opportunity employer m/f/h/v.



Bank of America N.A.

The Professional's Choice

SYSTEMS PROGRAMMER

University computer center seeking individual for systems programmer vacancy. Duties include analysis, implementation and maintenance of system software including operating systems, teleprocessing monitors and specialized software. Assist with application system development, linkage and implementation.

Minimum qualifications include working knowledge of operating system software (DOS/VSE and VAX/VMS), CICS and the FORTRAN, COBOL and BAL programming languages. Employment in this position is conditional upon a review of criminal conviction records.

Send resume to:

**Personnel and Payroll Office
PURDUE UNIVERSITY CALUMET
Hammond, IN 46323**

An Affirmative Action
Equal Opportunity Employer

COMPUTER ENGINEER "SUPERVISOR"

University computer center seeking individual for supervise and conduct in the design, installation, construction, maintenance and repair of computer, peripheral, data communications and computer interface equipment.

Minimum qualifications include BS in Electrical Engineering and one or more years in Digital computer design, including experience in computer maintenance and repair. One to three years of programming, including college work.

Send resume to:

**Personnel and Payroll Office
PURDUE UNIVERSITY CALUMET
Hammond, IN 46323**

An Affirmative Action
Equal Opportunity Employer

**GIVE YOUR
CAREER A
SHOVE BY
LOOKING IN
THE CLASSIFIED
PAGES OF
COMPUTERWORLD.**

1-800-343-6474 (617)879-0700

MIS

SUNBELT Opportunities

We are Gravely International, an established and growing outdoor power equipment producer located in the beautiful Winston-Salem Area of North Carolina. You will enjoy the workplace, the enthusiastic participation of our MIS team in the growth of our company - and our four-season climate and the recreational opportunities it provides.

We have immediate opportunities for Computer Professionals in the following positions:

ANALYST/PROGRAMMER

This is a rewarding opportunity for an individual with 3+ years experience on IBM 4300/370 processor with knowledge of DOS/VSE, JCL, SHADOW or CICS, IDMS, DLI and COBOL. Applicant experience should be in the areas of manufacturing and general accounting.

TECHNICAL SUPPORT PROFESSIONAL

We need you if you have qualifications to manage the 4341/FBA, DOS/VSE environment, DOS/VSE SYSGEN, SHADOW/QUOTA, IDMS, SYSTEM MANAGER, JARS.

GRAVELY INTERNATIONAL offers an excellent salary, commensurate with experience, as well as a complete company-paid benefits and relocation package. For more information, please send your resume with salary requirements, or call: Ed Stewart, GRAVELY INTERNATIONAL, INC., One Gravely Lane, Clemmons, N.C. 27012.

(919) 766-4721

GRAVELY

An equal opportunity employer M/F/H/V

SYSTEMS PROGRAMMER

*Enjoy an Ideal Southeastern Location
... With a Climate To Match!*

An excellent career opportunity awaits an experienced Systems Programmer due to our company's outstanding growth in a manufacturing field. This position includes responsibilities for installation, modification and tuning of systems software, including:

MVS, VTAM, JES, ROSCOE & TSO

Qualified candidates should possess 3-5 years experience in systems programming, including exposure to IMS DB/DC systems, communications techniques and job entry subsystems.

We offer an excellent salary and benefits package. Plus, you'll discover the advantage of living in a small town environment with close access to a major metropolitan area. For consideration, please send your resume and salary requirements to:

**CW-B4305
Computerworld
Box 880
Framingham, MA 01701**

Equal Opportunity Employer M/F



H&M

SYSTEMS SOFTWARE INC.

Leader in CICS Technology

has immediate openings for:

SOFTWARE SALESPeople Top Producers

Excellent opportunity for fast track professionals to handle lucrative openings in the DALLAS, CHICAGO and SAN FRANCISCO areas.

Ideal candidate will be a self-starter, familiar with CICS Systems Software, who will be selling to industry leaders ON-LINE DATA ENTRY and OFFICE AUTOMATION. We are looking for a super prospector, and even better closer.

Salary is commensurate with experience, (\$50-80,000 first year caliber), with fully paid benefits. For immediate consideration, please send your resume, in confidence, or call:

201-599-9111

H & M Systems Software, Inc.

351 Evelyn St. Paramus, NJ 07652

equal opportunity employer M/F

position announcements	position announcements	position announcements	position announcements	position announcements
------------------------	------------------------	------------------------	------------------------	------------------------

SYSTEMS PROJECT LEADER

Bachelor's degree or equivalent. Training in systems analysis, project management, business communications and management information systems, including data processing, project planning and supervision. Knowledge of education systems in a college environment preferred. Salary Range: \$26,025.84-\$38,748.96. Screening begins November 29, 1983. Submit official FJC application, transcripts and resume to Director of Personnel, Florida Junior College at Jacksonville, 501 W. State Street, Jacksonville, Florida 32202 (904) 632-3160. EOE

NEW ENGLAND

IDMS/IMS/DL-1	\$50,000
MAS CONSULTANT	\$45,000
SYS. PROG MVS/DOS-VSE/VM	\$40,000
SR EDP AUDITOR	\$38,000
BANKING SYSTEMS	\$35,000
MFG. SYSTEMS	\$35,000
CURRICULUM DEVELOPMENT	\$30,000
TECHNICAL WRITERS	\$30,000
RPG SYS 38/36/34	\$30,000
PROGS COBOL/PL-1/DIBOL	\$26,000

LEAHY & COMPANY

Personnel Consultants
88 Broad Street, Suite 301
Boston, Mass. 02110
Telephone (617) 423-4489

LEAD PROGRAMMER SYS 38

Prestigious midtown NYC financial corp has oppty for Senior DP pro with 1+ yrs hands-on Sys 38/RPG III programming exp. Responsibilities include training junior staff members, as well as assisting DP Mgr. This is #2 position within MIS. Exclnt growth & visibility. \$35,000 FEE PAID

ROBERT HALF OF NEW YORK, INC.
522 Fifth Avenue
New York, N.Y. 10036
212-221-6500 (agency)

Computer Book Editor

Leading trade publication seeks experienced, innovative editor. Responsibilities include acquiring and developing computer books in all formats. Familiarity with design and production necessary. Position based in New York City. Salary commensurate with experience. Send resume, with salary history to:

BALLANTINE BOOKS
A Division of Random House, Inc.
201 East 50th Street
New York, NY 10022
An Equal Opportunity Employer m/f



RANDOM HOUSE, INC.

ECS: A Tektronix Start-Up Venture in Wilsonville, OR.
Creating a High Performance Engineering Workstation

For 37 years, Tektronix has been the center of innovative electronics technology celebrated by customers worldwide. To continue that leadership role, we've created a new start-up group, Engineering Computing Systems, to substantially increase engineers' productivity.

Where is Wilsonville?

ECS is housed on 250 beautiful acres just 15 minutes south of Portland. Just off Highway 5, Wilsonville is still largely forests and farmland.

Where Would You Fit In?

Since January, we've more than tripled in size. That was our early project development phase. Now, if you are qualified for any of the positions listed below you can develop your own career at Tek.

Software Engineering Managers

UNIX Shell Manager

Plan, staff, and manage development of applications for ECS workstations. Knowledge of UNIX and Bourne Shell and at least 2 years experience managing software product development essential.

Real Time Operating Systems

Project Leader

Lead a small team developing a real-time operating system for our Engineering Workstations. Heavy customer interface, along with responsibilities for product specifications, and design/development/integration. With 3-6 years related experience, you should have a solid background in operating systems development and strong leadership skills. Knowledge of UNIX and C highly desirable.

Software Engineers

Help develop a real-time operating system, engineers to develop device drivers, process loader, boot processes, debugger, I/O manager for RTOS. You should have BSCS with minimum one years' experience. Familiarity with structured design techniques, UNIX and C desired.

Software/Hardware Manager

Oversee hardware/software interface to 410X products. Minimum 3 years experience as engineering manager in both software and hardware required, with strong knowledge of display systems.

Software/Hardware Project Leader

Lead a small team defining/ designing interface peripherals for ECS products. BSEE/CS and 2+ years experience with C, UNIX and in-circuit emulation required, with strong leadership skills.

Software Engineering

Software Engineers

With a BS or MS in Computer Science or related field, a working knowledge of C and UNIX desired, and 2-5 years experience in the appropriate specifications, you could qualify for a key role in one of these exciting ECS projects:

- Array Processor Architecture
- Compiler/Interface Architecture
- Distributed Network Architecture
- Diagnostics
- Instrumentation Interfaces
- Word Processing Software
- Diagnostic QA Feature Set
- Evaluation/Systems Integration
- Integrated Environment
- User Interface

Graphics Engineers

- Display Subsystems
- Window Management Software
- Graphics Editor Development
- Windowed Graphics Display
- Display Software Integration
- Graphics Interface
- Graphical Grammars
- Graphics Microcode
- Device Independent Graphics

To learn more . . .

. . . about the exceptional scenic, cultural and recreational resources of Oregon, plus our complete benefits package, including education and relocation, call Kathy Holmquist at (800) 368-6801, or send your resume to her at Tektronix, Inc., PO Box 1000, MS-61-248/02, Wilsonville, OR 97070.

Equal Opportunity Employer

*UNIX is a trademark of Bell Labs.

Tektronix®
COMMITTED TO EXCELLENCE

Analyst/Programmer I
\$17,638-\$22,942

AA degree in data processing and 1 year of recent DIBOL or BASIC programming experience on DEC RSTS opr. sys. required; 2 years of programming experience desired. This is not an entry level position. Apply immediately to:

City of Largo, Personnel
P.O. Box 296
Largo, Florida 33540
by 11/18/83
EOE M/F/H/V

I CAN HELP YOU MOVE

MVS System Programmer	45K
HOGAN EXPERIENCE	40K +
(Excellent Relocation Pkg)	
ADABAS (Heavy Financial)	40K
4700 ATM Software	36K
CPCS Experience	34K
CIF Project Leader	42K
ALC Programmer Analyst	35K
COBOL - Banking Systems	35K

MAKAN, INC.
10602 ELMDALE
HOUSTON, TX. 77070
(713) 469-1513

THE PENNSYLVANIA STATE UNIVERSITY
Continuing faculty positions in computer science at a number of The Pennsylvania State University's branch (2-year) campuses beginning in August, 1984. Candidates should be genuinely interested in teaching lower-division baccalaureate and service courses. Some positions may involve teaching in our Associate Degree program (COBOL). Please indicate specifically if you are interested in teaching at that level. M.S. in Computer Science is required for a continuing appointment (non-tenure track). Demonstrated desire for continued scholarly growth weighted heavily. A letter of application with resume and names of three people who may be contacted as references should be sent Dr. Fred L. Bierly, Computer Science Department, Box 202AA, Whitmore Lab, University Park, PA 16802. Deadline is January 15, 1984, or until all positions are filled. AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER.

SR. SYSTEM ANALYST
\$25 - \$35K

Firmly established company expanding their financial support group, seeking highly qualified professionals with a minimum of five years in financial systems design and analysis, in an OS, IDMS, COBOL environment. Opportunity to contribute and grow in a challenging environment. Excellent benefit package. FEE PAID.



ROBERT HALF OF MIAMI, INC.
2655 Le Jeune Road, Ste 814
Coral Gables, FL 33134
(305) 447-1757

IBM 38

Programmers, Programmer Analysts and Systems Analysts—Let us update you on the rapidly changing IBM 38 market coast-to-coast. To confidentially explore exciting new career opportunities, rush a resume or call Deanna Gear.

DUNHILL OF
ALBUQUERQUE, INC.
1717 Louisiana NE, Dept. C
Albuquerque, NM 87110
(505) 262-1871
Exclusively Employer Retained

CALIFORNIA
CONSULTANT/SYSTEM ANALYST
PROGRAMMER

Opening for DP consultant with young growing firm. Duties include: design, implementation and testing of new systems, maintenance and enhancement of existing systems. Must have WANG V.S. and RPG II knowledge. Must be well rounded person able to communicate with clients as well as DP personnel. Knowledge of IBM 34/36 and law firm applications a definite plus.

Reply to CW-B4304
Computerworld
Box 880
Framingham, MA 01701

UNIX* /C

\$25,000 to \$50,000
APPLICATIONS & SYSTEMS
Over 300 Openings Nationwide

Client co's pay all fees

Call or send resume

in confidence to:

J. ROGERS ASSOC
(609) 771-8282
2999 Princeton Pike, Dept C-D
Lawrenceville, NJ 08648
UNIX is a trademark of Bell Labs

WANTED!

Only the best DP people for our clients. If you have 2+ years experience in any area of Data Processing please give us a call. We represent many of the best companies in the southeast. We do not mass mail resumes. We provide an individualized service for our clients.

Adkins & Associates Limited
Data Search
P.O. Box 16062
Greensboro, NC 27406
Call: Don Wallace
(919) 378-1261

SYSTEMS ANALYST/PROGRAMMER
Brookline, MA Public Schools

Senior position available to design, program and implement on-line data based systems. HP3000, IMAGE, COBOL experience required. Send resume with salary requirement and salary history to:

Frederick P. Baker
Assistant Superintendent for
Administration and Finance
333 Washington Street
Brookline, MA 02146
Deadline: November 21, 1983
An Equal Opportunity Employer.

position announcements

position announcements

position announcements

position announcements

position announcements

Your software background will be respected and rewarded at Martin Marietta Data Systems.

**Where sophisticated software systems have
been our springboard to phenomenal growth!**

If you can show
expertise in these
software areas:

**CICS
ADABAS
IMS
MODEL 204
IDMS**

There are excellent
growth opportunities
in these positions:

**PROGRAMMER
ANALYSTS
PROJECT
MANAGERS
GROUP
PROJECT
MANAGERS**

In progressive,
dynamic cities like
these:

**New York
Philadelphia
Washington,
D.C.**

If you're interested in joining a company that is growing at twice the industry average based on development of sophisticated software packages and major systems development throughout the United States, then contact us. We are interested in energetic DP professionals

who can help us continue this growth. Call P. H. Shockley at (800) 492-6753 (in Maryland, call (301) 982-6697) for a local interview, or send your resume in confidence to: Martin Marietta Data Systems, 6305 Ivy Lane, Greenbelt, Maryland 20770.

MARTIN MARIETTA

An Equal Opportunity Employer

Principals Only

Vermont Castings is Vermont's Own Success Story. Just seven years old, we're the dynamic, high-growth producer of quality consumer products combining Yankee ingenuity with state-of-the-art technology. Our success is built upon the consistent beauty, durability, and craftsmanship of our products. We do it all amid the splendor of the Green Mountain countryside, an area highlighted by four-season recreational opportunities.

SYSTEMS PROGRAMMER

We are committed to the aggressive use of data processing in all phases of our business activities. In addition to automated accounting systems, the order processing, customer relations, marketing, and manufacturing functions are supported by on-line systems.

The successful applicant will have previous systems programming experience in an IBM environment. Previous experience with DOS/VSE, CICS, ICCF, DL-I, and assembler language is preferred. Preference will be given to candidates with an IBM mainframe (43XX) background, as well as PCs.

If you thrive on challenge, believe in being well-rewarded for your accomplishments, and possess the kind of creativity which results in excellence, we invite you to apply for this position. We offer an extensive benefits package, a stimulating work environment, and compensation competitive with that offered anywhere.

Please send your resume, in complete confidence, to:

**Bruce K. Crockett
Vice President of Human Resources
VERMONT CASTINGS, INC.
Prince Street
Randolph, Vermont 05060**

**Vermont
Castings
Inc.**

*New Energy
in Old Vermont.*

An Equal Opportunity Employer M/F/H



PROGRAMMER ANALYST

Requires 2 years of COBOL experience on large IBM systems. Retail, Point of Sale, DOS/VSE experience desired.

D.P. MANAGER

B.S. in Computer Science plus experience in hardware and software selection required. Position will involve systems design and programming on Mini in top notch company.

D.P. SALES MANAGER

Responsible for horizontal and vertical sales strategies for an established micro/mini computer dealer. Solid computer sales experience in a dealer environment plus 1-2 years software experience is required.

Total compensation package based on related experience. EOE. NO FEE. Relocation package available. Send resume to:

**SNOW'S RECRUITERS
880 N Street, Suite 302
Anchorage, Alaska 99501.**

SR. PROG./ANALYST

Fortune 1000 corp. actively seeks solid people oriented sr. prog./sys. analyst. Desire a "fast start up" person w/COBOL, CICS, DL-1, VSAM & ISAM exp. for 4341 data ctr. A professional oppty. for hard working sys. expert who enjoys a somewhat "laid back" environ. \$33,000.

Robert Half of Buffalo, Inc.

1310 Liberty Bldg.
420 Main Street
Buffalo, NY 14202
(716) 842-0801

Be sure you
look over our
recruitment ads
every week,
so you don't
miss the opportunity
that's just right
for you.

DIRECTOR — MANAGEMENT INFORMATION SYSTEMS

The Massachusetts Port Authority, owner and operator of Logan International Airport, Tobin Memorial Bridge and the Port of Boston, is seeking an experienced professional for the position of Director of Management Information Systems. Reporting to the Director of Administration and Finance, the individual will be responsible for the development and automation of all new and existing Massport management systems. Other responsibilities include administration of facility management contracts; development and implementation of long range MIS/DP plans; strategic planning for the acquisition of new technological capabilities; and providing the lead technical role in implementing an office automation program.

The successful candidate must have 6 years experience as a systems development or data processing manager and 3-5 years experience in data processing, systems analysis or programming. MBA or advanced degree is highly desirable. Salary mid to upper 40's commensurate with experience.

Please submit resume with salary history (in confidence) no later than November 25, 1983 to Director of Personnel



Massachusetts Port Authority
99 High Street
Boston, MA 02110

massport

An Equal Opportunity/Affirmative Action Employer

SOFTWARE Engineers/Scientists

Technicon, an internationally known and respected division of a major corporation, and a leader in the field of automated analytical instrumentation, is seeking creative software professionals.

These challenging positions require BSEE or Computer Science degree with a minimum 3-5 years of real-time software experience, utilizing structured programming methods with PASCAL.

Candidates should also have demonstrated design and implementation skills in the areas of multi-user operating systems, file management techniques and computer/human interfacing.

Technicon provides a most professional working environment and an attractive compensation and company-paid benefits package.

To explore these opportunities please send resume with salary requirements in confidence to: Manager Technical Staffing.

TECHNICON INSTRUMENTS CORPORATION
511 Benedict Avenue, Tarrytown, NY 10591

An Equal Opportunity Employer M/F/H/V

TECHNICON T M

HOW TO MAKE OVER \$80,000.00 A YEAR ON CICS COMMAND LEVEL PROGRAMMING

Acquire one of the most demanded & rewarding programming skills in months instead of 3 to 5 years. A complete self-study book based on CICS latest version 1.5, written in COBOL and with special emphasis on VSAM. It covers virtually every CICS technique you will ever need. Fifteen (15) sample programs address all CICS major applications. Sample programs include: Menu, Add, Update, Delete, Browse, Print 24x80, Print 66x132, Print Any Size Report, Message Routing, Screen Refreshing, VSAM Alternate Index Setup and Manipulation, Constant Table Setup and Use and more.

It is hard to believe the learning can be so easy until you try it. In hours, you can start to create your own BMS maps; in days, you can start to write your own pseudo conversational CICS programs. Some CICS techniques are especially hard. When you are stuck for the technical problems, you'll be thankful you have this book.

Moonlighting on CICS projects is very rewarding. A typical 10-screen system can mean \$15,000 cold cash. This book also tells you how to market your services, locate the contracts, write a proposal, make a presentation, quote the right price & draw a contract agreement without a lawyer. Sample written proposal & contract agreement are included for your convenience.

But act now. Send \$34.95 (plus \$2.00 for shp. & hndl.) in Check or money order to: CCD ONLINE SYSTEMS, INC., P.O. BOX 795759, DALLAS, TX 75379. Allow 1 to 2 weeks for delivery. Full refund within 10 days if not satisfied.

ACADEMIC COMPUTING SUPPORT MANAGER

The University of Scranton is seeking qualified applicants for the position of Academic Computing Support Manager. We need a dynamic and creative individual to assist academic users engaged in computer-related projects; to identify academic activities which would benefit from computer application; to keep the faculty informed of current academically related hardware and software developments; and to provide for the software needs of academic programs and research projects.

The manager we seek should have an academic background and professional interest sufficient to facilitate interaction with a diverse faculty. He/she should have work experience with computer usage in an academic environment. Excellent communication skills and organizational skills are required for maintaining active relationships with in-house computer support groups and with outside vendors of hardware and software.

This is a senior staff position that reports directly to the Academic Vice President.

The University of Scranton is a Jesuit institution located in the center of Scranton, a city with a population of 90,000. Scranton and its neighbor Wilkes-Barre form the cultural, medical, retail and industrial center for Northeast Pennsylvania. The campus is within minutes of affordable residential housing in beautiful wooded hillsides. Four seasons of outdoor recreational activities are available in the nearby Pocono Mountains. The attractions of New York City and Philadelphia are but a couple of hours away.

Applications should be sent by January 1, 1984, to:

**Dr. Henry Amato, Chairman
Search Committee
School of Management
University of Scranton
Scranton, Pennsylvania 18510**
An AA/EEO Employer/Educator

position announcements	position announcements	position announcements	position announcements	position announcements
------------------------	------------------------	------------------------	------------------------	------------------------



DO YOU HAVE ANY QUESTIONS ABOUT YOUR
COMPUTER CAREER GROWTH?

You can get the answers from NCA. All our people are specialists on all aspects of career advancement as well as on the current opportunities market. They can provide you with dependable, realistic information on any questions you may have . . . and without any obligation to you whatever. Just call. Or come in. Or mail your resume, with your questions, to the NCA firm nearest to you.

ATLANTA: BAI Limited
229 Peachtree Street, Suite 1601-C
Atlanta, Georgia 30303 (404) 581-0040
BOSTON: Robert Kleven and Co., Inc.
North Brook Park, Suite One, 181 Bedford Street
Lexington, Massachusetts 02173 (617) 861-1C20
CHICAGO: Thos. Hirtz & Associates
150 N. Wacker Drive, Suite 1700
Chicago, Illinois 60606 (312) 977-1555
COLUMBUS: Michael Thomas, Inc.
65 E. Wilson Bridge Road, Suite 201
Worthington, Ohio 43085 (614) 846-0926
DALLAS: DataPro Personnel Consultants
12720 Hillcrest, Suite 520
Dallas, Texas 75230 (214) 661-8600
DETROIT: Electronic Systems Personnel, Inc.
3000 Town Center, Suite 2580
Southfield, Michigan 48075 (313) 353-5580
FLORIDA: Data Sciences Personnel, Inc.
P.O. Box 8577
Hollywood, Florida 33024 (305) 434-6112
HARTFORD: Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105 (203) 549-4240
HOUSTON: Career Consultants, Inc.
2000 South Post Oak
Houston, Texas 77056 (713) 626-4100
INDIANAPOLIS: Computer Personnel Services, Inc.
107 N. Pennsylvania
Indianapolis, Indiana 46204 (317) 634-4712
KANSAS CITY: O. P. Career Associates
6405 Metcalf, Suite 502
Shawnee Mission, Kansas 66202 (913) 236-8288

LOS ANGELES: Superior Resources, Inc.
17141 Ventura Boulevard, Suite 200
Encino, California 91316 (213) 986-4400
MILWAUKEE: EOP Consultants, Inc.
7332 West State Street, Suite 3
Milwaukee, Wisconsin 53213 (414) 475-0077
MINNEAPOLIS: Electronic Systems Personnel
858 Twin City Federal Tower, 121 S. 8th St.
Minneapolis, Minnesota 55402 (612) 338-6714
NEW JERSEY: Systems Search
90 Millburn Avenue
Millburn, New Jersey 07041 (201) 761-4400
NEW YORK: Botal Associates, Inc.
7 Dey Street, Suite 410
New York, New York 10007 (212) 227-7370
NEW YORK UPTOWN: CFA Associates Personnel, Inc.
2530 James Street
Syracuse, New York 13206 (315) 463-5225
NORTH CAROLINA: DataMasters,
Div. of TaskForce, Inc., P.O. Box 688B
Greensboro, North Carolina 27405
(919) 373-1461
PHILADELPHIA: Systems Personnel, Inc.
115 West State Street
Media, Pennsylvania 19063 (215) 565-8880
PHOENIX: Professional Career Consultants
4628 North 17th Street, Suite H101
Phoenix, Arizona 85016 (602) 274-6666
SAN FRANCISCO: The Computer Resources Group,
Inc. Agency, 303 Sacramento Street
San Francisco, California 94111 (415) 398-3535
SEATTLE: Houser, Martin, Morris & Associates
1940 116th Avenue N.E.
Bellevue, Washington 98004 (206) 453-2700
WASHINGTON D.C.: ESP Systems Corporation
914 Lambert Drive
Silver Spring, Maryland 20902 (301) 649-6171



National
Computer
Associates

Call the NCA firm
nearest to you
for Salary Survey
and Relocation
information.

MVS
SYSTEMS
PROGRAMMER

The Atlantic Companies, a progressive property/casualty insurance company is seeking an MVS Systems Programmer for employment at our scenic Roanoke national processing center located in the heart of Virginia's Blue Ridge mountains.

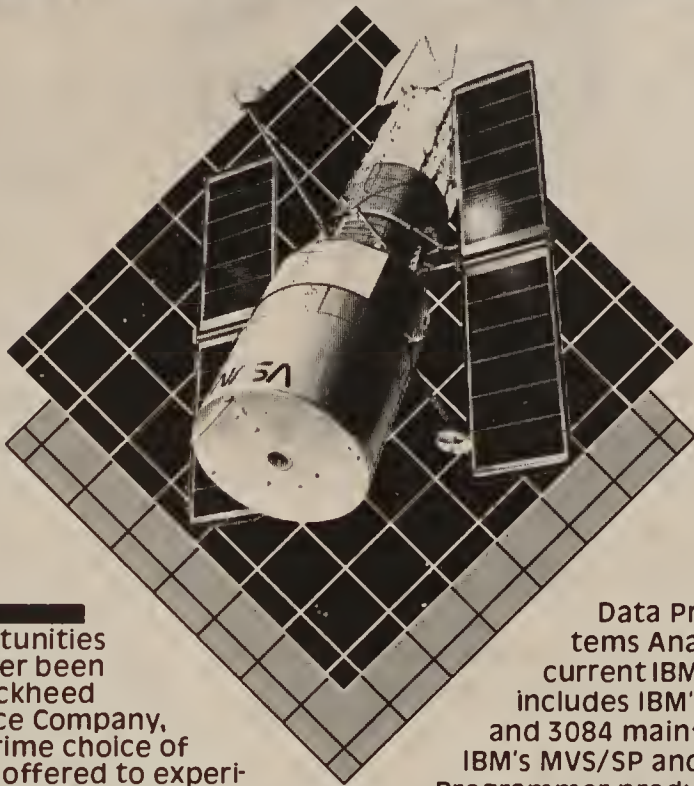
Duties include support of MVS, JES2 and related software products on an IBM 3033. Candidate should have 3-5 years systems programming experience with 2 years as an MVS Systems Programmer. Assembler language is required. Exposure to ACF/VTAM, TSO, IMS/DC is desirable.

We offer competitive salaries and excellent benefits program. Please send resume to: Claudia Lambert, The Atlantic Companies, P.O. Box 4657, Roanoke, Virginia 24015.

The Atlantic Companies

an equal opportunity employer m/f

LOCKHEED
IS BUILDING
CAREERS.



The opportunities have never been greater. At Lockheed Missiles & Space Company, you'll find a prime choice of careers being offered to experienced engineers and computer science professionals. Our work will involve you with some of the most ambitious projects in the nation. Take a look at the opportunities below and take a look at your future.

SYSTEMS ENGINEERS

Positions are available at various levels for Systems Engineers to evaluate engineering disciplines for contractual compliance, perform system hazard analyses of aerospace products and operations, and certify products. You will also make presentations to management, contractors and customers. A BS in engineering or a related discipline and P.E. license is desirable.

SENIOR DATA SYSTEMS
ANALYSTS

In this position, you will design and develop programming systems for processing management and central data on IBM 3033, 3081 and 3084 systems. In addition, you will analyze customer and project systems requirements and negotiate new or revised programming systems for effective computer processing. You should have a proven track record of progression through Business Systems, Applications Programming, Data Base Design and Analysis, or

Data Processing Systems Analysis. Our current IBM environment includes IBM's 3033, 3081 and 3084 mainframes with IBM's MVS/SP and IBM's VM/SP. Programmer productivity aids include CMS and TSO/SPF. The Business programming language is COBOL. A BS in Computer Science, or Math and six to eight years of experience is desired.

SENIOR SYSTEMS
PROGRAMMER

We are currently seeking a professional person who has expertise in software systems design and development activities. Responsibilities will include maintenance of IBM system software, insuring systems conformance to government requirements concerning software security and leadership of junior personnel. A minimum of nine years of IBM related experience with IMS and OS/MVS internals and IBM's Assembler language is required.

EXPERIENCE WITH SPECIAL ACCESS
PROGRAMS AND CURRENT EBI
DESIRED.

For immediate consideration, please forward your resume to Lockheed Missiles & Space Company, Professional Employment, Dept. 653-1114; P.O. Box 504, Sunnyvale, CA 94086. We are an equal opportunity, affirmative action employer. U.S. citizenship is required.



Wafer Fab Industrial Engineer: Provide Industrial Engineering support for a Microelectronics Wafer Fabrication operation to include plant and equipment performance measurement and standards, capacity analysis as well as productivity and quality improvement projects. Responsibilities include coordinating equipment installations, defining manufacturing methods and procedures, and designing miscellaneous jigs and fixtures. Experience in work measurement and production methods. Experience or background in computer programming, Basic and Fortran a must. Knowledge of Finance and Engineering Economy. BS Ind. Engr., experience 1 year, \$2150/mo. Job location: Rio Rancho, New Mexico. Send resume to: ESD, Ed O'Brien, 6209 Hendrix N.E., Albuquerque, New Mexico 87110. Please refer to #829270.

PROGRAMMER ANALYST
\$26,507 - \$31,177
PLUS EXCELLENT BENEFITS

San Francisco Bay area city has immediate opening for self-starting professional. Knowledge of on-line systems, COBOL and data base management systems required. HP 3000 experience highly desirable. Equiv. to BS in related field and two years programming experience. Please call (415) 966-6309 or see us at City of Mountain View, Personnel Office, 540 Castro Street, Mountain View, CA 94042. Completed City application must be received by Nov. 23, 1983 at 5:00 P.M. EOE

HEWLETT PACKARD OPENINGS
ALL FEE PAID
NC, SC, VA

If you have Hewlett Packard experience, and are seeking progressive, innovative firms to further your career path, call today. I am representing 9 opportunities ranging from programmer analyst to systems analyst from 20 - 31K. Call:

DIANE AMOS, C.P.C.
DP PROS
PERSONNEL PLACEMENT, INC.
(919) 584-5591

position announcements

position announcements

position announcements

position announcements

position announcements

Systems Architects

Influence the future with NCR

Innovation is the charter of the NCR Retail Systems Architecture group. This makes a highly challenging and rewarding environment for the small group of professionals who cover the major aspects of information processing and communications. Expertise within the group ranges from VLSI semiconductor technology all the way through turnkey application systems.

Key areas under investigation at this time include, but are not limited to, integrated distributed information systems, syntax driven point of sale terminals, office automation, home shopping, application generators, very friendly user interfaces, personal computers, and the exploding world of telecommunications.

As a Retail Systems Architect you will be in a direction setting position for advanced software and hardware architecture. Key responsibilities will include your maintaining industry and technology awareness, developing architectural concepts and standards, transferring technology to product designers and developers, and alerting management to major issues and opportunities within your field of expertise. There are immediate openings for the following architects:

COMMUNICATIONS

Chart a course for large, internationally distributed networks. Provide expertise in SNA, OSI model, LAN's, PDN's, PBX, satellite communications, integrated voice and data, etc.

COMPUTER LANGUAGE/USER INTERFACES

Define the architecture for retail application generation and very friendly user interfaces. A thorough knowledge of computer based languages and compiler technology is required.

SYSTEMS SOFTWARE

Define the strategy for major software components of small computer systems. This includes languages, JCL, SCREEN managers, DBMS, operating systems internals, utilities, editors, tools, etc. An in-depth knowledge of UNIX* is a definite plus.

HOME SHOPPING

Lead NCR into the future of retailing by defining the architecture of systems for home shopping. Apply your broad knowledge of computer and communications technologies to change the way the world shops. A knowledge of Videotex is a plus.

Background should include an advanced degree in CS and 6 or more years of system design/development experience. Salaries will be commensurate with experience and responsibilities. Benefits, including relocation assistance, are what you would expect from an expanding \$3.5 billion computer company.

For prompt confidential consideration send your resume including salary history and requirements to:
Mr. Stephen Green, Personnel Resources, Systems Engineering-Retail, NCR Corporation, Dept. H55, Software Development Center-4, Dayton, Ohio 45479.



An equal opportunity employer

* UNIX is a registered trademark of Bell Laboratories

ENGINEERS

Systems/Software Engineers

Southern California

Hughes Support Systems is seeking Systems/Software Engineers for a multi-million dollar program implemented in a real-time, closely coupled, multi-processing environment. A minimum of three years experience is preferred. Areas of interest include real-time operating systems such as SEL's MPX-32 and DEC's RSX and VMS. Experience with I/O Drivers is a definite plus. We also need people who have successfully performed complex system modelling and analysis activities in the past.

At Hughes, we offer competitive salaries and outstanding benefits including family medical, dental and vision-care insurance.

Let's discuss our mutually beneficial future. Mail your resume to: Lowell Anderson, A1/1B404, Hughes Support Systems, Dept. 122, P.O. Box 9399, Long Beach, CA 90810-0399. Or call collect to Larry Stern, (213) 513-4260.

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY
SUPPORT SYSTEMS

Proof of U.S. Citizenship Required
Equal Opportunity Employer



In a bind?

Do you
need real
professionals?

Advertise in
Computerworld

to find
exactly who
you're looking for.

Because...

More computer people
read Computerworld
than any other
newspaper in the
United States--more
than half a million

computer people every
week. And, among our
529,650 readers

at user organizations,
about half claim to
look at recruitment ads
at least every other
week (only a small
percentage say they
never look at
recruitment ads).

No wonder
Computerworld
carries more
recruitment ads for
computer people than
any other publication.

To place your ad
or

to get a rate
Call or write:

**Classified
Advertising
Computerworld
Box 880**

**Framingham, MA
01701**

(617)879-0700

(800)343-6474

A DYNAMIC DIFFERENCE IN YOUR CAREER

Dynamic Control is the nation's leader in developing healthcare software systems. We have entered into a complementary marketing agreement with IBM Corporation which has increased our volume and our need for experienced systems professionals.

Programmers Programmer/Analysts

Make the most of your experience in coding RPG II on System/3 or System/34 or RPG III on System/38 in an interactive on-line environment. A minimum of 2-3 years coding experience may qualify you for projects with national or international travel, competitive salary and benefits, and advancement potential.

Financial Installers

You will work with hospital financial staffs to assist with the installation of automated financial and accounting systems. Other duties will include training of customer personnel and system modifications. We require hospital accounting and hands-on experience with an automated hospital information system.

At Dynamic Control in Orlando, you'll enjoy our ideal year-round climate along with the absence of state income tax. We also have openings in our Bethesda, Maryland office. For immediate consideration, please send your resume to the address below or call Personnel, **TOLL FREE, 1-800-327-5352**, or from within Florida, call **COLLECT, 305-671-4483**. **Dynamic Control, Personnel Department, 1311 S. Semoran Blvd., Winter Park, FL 32792.**



Dynamic Control

A Division of Travenol Laboratories, Inc.

An Equal Opportunity Employer M/F

WEST COAST ADVERTISING SALESPERSON IMMEDIATE OPENING

CW Communications/Inc., the world's leading publisher of computer-related magazines and newspapers, has a newly created position available for an advertising salesperson in their International Marketing Services Department.

Based in San Francisco, the qualified candidate will be responsible for international advertising sales on the West Coast with an emphasis on personal computer hardware, software, supplies and related products. The candidate should have an understanding of the roles of international advertising and marketing.

CW International Marketing Services is responsible for the U.S. advertising sales of their fourteen personal computer publications and twenty four professional computer publications that are published in foreign countries.

We offer a good salary and compensation structure. The candidate for this job will report directly to the General Manager of CW International Marketing Services.

To apply, please send your resume in confidence to:

**General Manager
International Marketing Service**



CW COMMUNICATIONS/INC.

375 Cochituate Road, Box 880
Framingham, MA 01701

An equal opportunity employer of men and women.

INTERNATIONAL SALES MANAGER

We have a good international business. We need you to make it better. And we have the resources and support you need. You must have an entrepreneurial bent, software product sales experience and an eagerness to build a business. We are a financially strong public company with a major emphasis on quality and a product line that features the market leaders, Single Image Software and Top Secret. Send us your resume or give us a call:

**CGA Software Products Group, Inc.
960 Holmdel Road
Box AD
Holmdel, NJ 07733
(201) 946-7550**

position announcements

DATA PROCESSING OPPORTUNITIES AT SYSTÈME

OUR REPUTATION FOR FINANCIAL SYSTEMS EXCELLENCE ISN'T JUST BEING BUILT...IT'S BEING EARNED.

In the field of information processing, great reputations aren't earned overnight. But in just 3 short but remarkable years, Système is becoming known as perhaps the most innovative manufacturer of financial hardware and software ever. Initiating breakthroughs and making the kind of advances that are propelling us further in today's leading edge technology and adding new excitement to those professionals who choose a career with us.

Senior Software Architect

In this lead position, you'll need 10 or more years experience with DEC PDP 11 Series computers with RSX 11M Operating System. Experience with micro-based financial terminals and terminal networks, communications protocols and Macro Assembly language is required. Real time systems design experience and the ability to take overall design responsibility is also necessary.


Applications Programmer

You'll design systems and write programs for financial applications. To qualify, you must have 3-5 years experience in business applications, preferably financial (banking would be ideal), the ability to handle a DEC PDP 11 with RSX 11M Operating System, an understanding of Assembly language, and experience utilizing minicomputer assembler to design related software. You should currently be working in an on-line real time multi-tasking environment. Good documentation skills would be a plus.

DEC Systems Engineer

In addition to the requirements listed for the applications programmer, you'll need experience in on-line terminal systems utilizing minicomputers with both up and down-line communications. Also required is the ability to develop specifications, set installation schedules, make customer systems operational and deal effectively with non-technical customer personnel. Communications software knowledge plus a knowledge of hardware is also essential. (This position requires frequent travel.)

Once you join the Système team, you'll receive an excellent salary plus comprehensive benefits including relocation assistance. To apply, please send your resume, in confidence to: Personnel Manager,




Système

Corporation

3443 Parkway Center Court, Orlando, Florida 32804
(305) 298-8180
Equal Opportunity Employer M/F

position announcements



amdahl

The Brilliant Technology

What contributions can technical professionals make to Amdahl's brilliant technology?

In 1975, the Amdahl 470 was a marvel of computer engineering. In 1982, the Amdahl 580 extended that marvel. Between the two, the price-performance ratio of all large-scale computers rose 800%. Investigate the contributions you could make to extend Amdahl's history of brilliant technology even further.

Software

Software is a major investment at Amdahl. Contact Bob Tyler at (800) 538-8460, extension 6190 (from California call (408) 746-6190 COLLECT) about these excellent opportunities:

- Enhancements/Modifications
- Installation/Maintenance
- Sysgens
- Software Compatibility
- Software Development
- Software Quality Assurance & Test

Programmers need 2-7 years VM or MVS background in an IBM 370 environment, with experience in one or more of the above areas. Managers need 1-2 years management experience in addition.

Hardware

Contact Sam Osaki at (800) 538-8460, extension 7686 (from California call (408) 746-7686 COLLECT) about these opportunities to contribute to Amdahl's leading technology:

Sr. System Design

- Bipolar ECL Design
- Microprogramming
- I/O Processors
- Channels
- Prototype Bring-Up
- Sustaining
- Memory Systems/Cache
- Console
- Instruction Unit
- Arithmetic Unit

BS/MSEE or equivalent and 3+ years related experience designing high-speed medium to large-scale computer or peripheral systems required.

Hardware Diagnostics

Intermediate/senior/manager level positions require BS/MSEE or CS and 3+ years related experience. Use of Assembly languages and OS to exercise hardware of large-scale computer systems, plus a working knowledge of high-level languages and system architecture. Field engineering, system test or prototype bring-up experience.

Your contribution to Amdahl's brilliant technology will be recognized and rewarded. Call either Bob Tyler or Sam Osaki, or send your resume to their attention, Amdahl Corporation, MS-300, Dept. 11-179, P.O. Box 470, Sunnyvale, CA 94086. We are an equal opportunity employer through affirmative action.

the amdahl phenomenon

BUY•SELL•SWAP

BROOKVALE

RENT•SELL•UPGRADE•BUY

DEC

PDP 8, 11/03, 11/04, 11/23, 11/24, 11/34, 11/44, 11/45, 11/60, 11/70, VAX/750, VAX/780

SYSTEMS•OPTIONS•SUPPLIES

11/70 512Kb MOS, LA36 (used) *new also available	\$48,500
11/34A 128Kb MOS, Dual RL02's, cabinet (new)	\$13,495
11/23 128Kb MOS, Dual RL02, CAB, VT 102 (new)	\$14,850

Customized Configurations-Call With Your Request.

In Stock	Specials	In Stock
11/04-DC (unused).....\$2,850	H9642 (new).....\$1,350	
DB11-A (unused).....\$ 495	LP11-WA (unused).....\$3,495	
DD11-DK (new).....\$ 650	MS750-CA (new).....\$4,195	
DL11-E (used).....\$ 375	MS750-DC (new).....\$8,950	
DMF32-AB (new).....\$3,495	RH780 (used).....\$3,850	
DU11-DA (used).....\$ 795	RL02K-DC (new).....\$ 165	
DZ11-E (new).....\$3,595	RUA80-AA (new).....Call	
FP750-AA (new).....\$5,970	VT102-AA (new).....\$1,395	

BROOKVALE ASSOCIATES

40 ORVILLE DRIVE • BOHEMIA NEW YORK 11716

(800) 645-1167 • NEW YORK (516) 567-7777

SERIES I SPECIAL

Control Data

126MB Removable Drives ..\$12,900

Diskette Drives\$ 1,495

Printers & Displays

New or Used

Immediate Delivery

IBM

4956 Processors

4967 200MB Disk Drives

All Peripheral & Features

ALL UPGRADES

Save Money On Your Present Equipment With Our Purchase/Leaseback Program

DISK 3340 3350 3370 3375 3380

PRINTERS IBM - All Models NEC - Letter Quality for S/34, S/38 DATAPRODUCTS - 340 CPS to 1500 LPM for all IBM Systems

LEASING SHORT OR LONG TERM NEW OR USED

SYSTEM 38 New or Used

SYSTEM 34/36

SERIES I IBM & CDC CPU's ALL MODELS

DISK TAPE

BUY SELL LEASE IBM Maintenance Guaranteed, Equipment Configured to Your Requirements.

IF IBM MAKES IT, WE CAN SAVE YOU MONEY - whether you buy, lease or rent from us. We also need to buy your owned or rental credit equipment. Call us for a quote.

Marshall Lewis & Assoc., Inc. ML & A 92705 1-800-IBM-USED In California (714) 641-0366

Member Computer Dealers & Lessors Association

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap



If we can't get it, it can't be got!

The Total Computer Company...

- Flexible lease terms.
- Purchase lease-backs.
- Equipment for sale.
- Maintenance service contracts.
- Substantial inventory available.
- Refurbishing & reconfiguration by our own staff.
- Data center relocations & installations.
- Custom software design.

Available Immediately...

IBM Mainframes		
4341		3033
4331		3031
IBM Peripherals		
3350	3203	3278
3375	3211	3274
3380	3811	3276
3880	3505	3287
3803	3525	3704
3420	3178	3705

Hartford Computer Group

A Subsidiary of Hartford Financial Corporation
515 East Golf Road, Arlington Heights, IL 60005

800-323-6355

or 312-364-0505



BUY • SELL • LEASE

SERIES-1

S/34 • S/36 • S/38

4300

S/23 S/32 5110-20
Tape • Disk • Printers • Tubes

AMCOM
CORPORATION
5200 W 73RD ST • MINNEAPOLIS, MN 55435
(612) 835-4737

CALL TOLL FREE
800-328-7723

C.D. SMITH & ASSOCIATES, INC.

DEC computer systems & options
12605 East Freeway, Suite 318
Houston, Texas 77015
(713) 451-3112
TELEX 76-2547

DEC

WE ARE BUYING: VAX 11/780, TU78

WE ARE SELLING:

RH750	6,000	DW780-AA	10,000
FP750	5,500	H9602-HA	5,000
DW750	7,000	DR11-W	1,495
MS750-DC	10,000	TU77-MSTR	17,000
MS750-CA	4,000	M8728	1,300
MS780-DC	5,000	RH11	3,000
FP780-AA	9,200		

If you want on our Mailing List, call Valerie (713) 451-3112.

SPECIALS (New)

Diablo 630 API	\$1,695
Diablo 620	\$895
TVI 910	\$525
TVI 925	\$745
TVI 950	\$940
Okidata 82A	\$425
TI 810's & Pkgs.	\$750
TI 763's	\$695
NEC All Models	25% Off
DEC LA34DA's	\$650

QUANTITY DISCOUNTS AVAILABLE

We Also Discount Computers
- NEC QANTEL -
Texas Instruments
THE SKIERS
• 516-242-8996
PO Box 754
• 1145 Walt Whitman Road
• Melville, New York 11747



NPA

Integrity today for a tradition tomorrow

SYSTEMS INC.

SPECIALIZING IN:
**PURCHASE
SALE, TRADE,
LEASE, RENT,
AND SERVICE OF**
Data General
EQUIPMENT



10,000 SQ. FT. WAREHOUSE FULLY STOCKED
761 COATES AVENUE HOLBROOK, N.Y. 11741
TELEX # 510 222 0882
(516) 467-2500

SERIES/1

One of 10 reasons why you should buy or lease your Series/1 from ECONOCOM.

SIZE

We're large enough to handle any size transaction but small enough to want your business—and, willing to work hard to keep it.

For a copy of our brochure outlining all 10 reasons to deal with ECONOCOM call Nancy Hurley at 1-800-238-3098 or write—



ECONOCOM

845 CROSSOVER LANE
P. O. BOX 240297
MEMPHIS, TENNESSEE 38124



IBM UNIT RECORD EQUIPMENT & DISK DRIVES

DISK PACKS, DATA MODULES, MAG. TAPE, DISKETTES




SALE OR LEASE

machines
026—029—082— 083— 084
085—087—088— 129— 514
519—548—557



disk packs
2316—3336(1)—3336(11)—3348(70)
5 MEG. TO 300 MEG. PACKS—NEW & USED
Highest Prices Paid for Used Packs & Machines






THOMAS COMPUTER CORPORATION

5633 W. Howard St. Chicago, IL 60648
800-621-3906 312-647-0880
Authorized Distributor — Memorex, CDC, 3M, BASF, Verbatim, Dysan

ALL 370 & 43XX SYSTEMS

CPU's & Peripherals

Purchased, Sold & Leased



CORPORATE COMPUTERS, INC.

Contact:
Norm Burger

(203) 661-1500
115 Mason St., Greenwich, Conn. 06830
Member Computer Dealers & Lessors Association

buy

sell

swap

buy

sell

swap

buy

sell

swap

buy

sell

swap

buy

sell

swap

Attention!

IBM

SERIES/1
S/34
S/38
5110-5120
S/32

SYSTEM/36
EARLY DELIVERY
GREAT LEASE RATES

BUY
SELL
LEASE

ALL MODELS
SYSTEMS AND
PERIPHERALS
AVAILABLE NOW!

CALL
(408) 425-7333

SOURCE
DATA PRODUCTS, INC.
1114 WATER ST., SANTA CRUZ, CA 95063

mdisco®

Your First Choice In The Second Market

- IBM PROCESSORS

 - 308X 36-60 Month Leases (ITC Lessor or Lessee)
 - 3033 Available for lease or sale now
 - 3032 Available for short term lease
 - 3031 Available for lease or sale now (along with A/P's)
 - 4341 We're Buyers, Sellers and Lessors of Group I's and II's
 - 4331 Group II's available for lease or sale
 - Memory/Channels available for 303X, 4300 and all 370's
- IBM PERIPHERALS

 - 3880/3830 Immediate Availability
 - 3380/3375 Immediate Availability
 - 3350/3370 Immediate Availability
 - 3803/3420 Immediate Availability (All models)
 - 3800 3704/3705 30-day Availability
 - 3811/3211 Immediate Availability
 - 327X We're Buyers, Sellers and Lessors

We Can Put It Together

Eastern Regional Headquarters
(Connecticut) 203/655-1211
New Jersey 201/568-9666
Washington, D.C. 301/441-1000
Philadelphia, PA 215/545-8035
Boston, MA 617/542-4005

Midwestern Regional Headquarters
(Chicago) 312/698-3000
Michigan 313/644-1500

Western Regional Headquarters
(San Francisco) 415/944-1111

South Central Regional Headquarters
(Dallas) 214/641-3255
Atlanta 404/256-5956
Florida 305/428-3177
Houston 713/445-1815

Canadian Regional Headquarters
(Toronto) 416/968-7135

International Headquarters
(Chicago) 312/698-3000
Latin America 305/666-6258
Paris 01 524.5270
Switzerland 41 (21)71.09.35
West Germany (2434) 5048

Corporate Headquarters
6400 Shafer Court 312/698-3000
Rosemont, IL 60018 TWX 910-253-1233



A MEMBER OF CDLA AND LISTED ON THE NEW YORK STOCK EXCHANGE

BUY-SELL-LEASE

SERIES/1

SAVE ON NEW OR USED
OVER 2000 CUSTOMERS

S/38
4331
4341

ALL RELATED PERIPHERALS

S/34
SEE OUR NEW PRICES

S/36
SHORT/LONG TERM LEASES

3033
3081

3350	3370	3340
3380	3375	3344
3411	3420	3430
3278	3274	3276

Call toll-free 800-328-5718
(In Minnesota, 612-544-8660)

COY COMPUTER OPTIONS, INC.
"The Best Option"
1600 South Highway 100
Minneapolis, MN 55416

***** DEC *****

BUY—SELL—LEASE—TRADE—CONSIGN

SYSTEMS — PROCESSORS — OPTIONS
PERIPHERALS — MODULES — MEMORY
— SPARES —

NATIONAL COMPUTER EXCHANGE

800-854-7224

6980 Aragon Circle, Suite 5 • Buena Park, CA 90620
(In Calif.) 714-522-1870 TWX: 910-596-1499

System/34
Printer &
Displays
Sale/Lease

3880 3830
3803
Immediate Delivery

WANTED
4341 Grp 1 or 2
For Outright Purchase
Or Purchase-Leaseback
Short or Long Term

DASD
3380 3375 3370
3350 3344 3340
3330 3310
Immediate Delivery

We Buy, Sell & Lease
IBM Processors and
Peripheral Equipment

Tape Drives
3420
3410 8809
Immediate Delivery

Printers
3287 3289
3203 3211
3262 1403
Immediate Delivery

Display Stations
3278 3277
Immediate Delivery

Contact Bernie Gest 215-782-1010

Computer Marketing Inc.
7704 Seminole Ave., Philadelphia PA 19126

CDLA

PRIME
COMPUTER USERS

New 80 and 300 megabyte drives
Available for immediate delivery.
300/1440 LPM Printers
also available.
Nationwide CDC maintenance
and financing.

Call Barry Dacks
Timesharing Services Inc.
(904)396-7068

buy

sell

swap

buy

sell

swap

buy

sell

swap

buy

sell

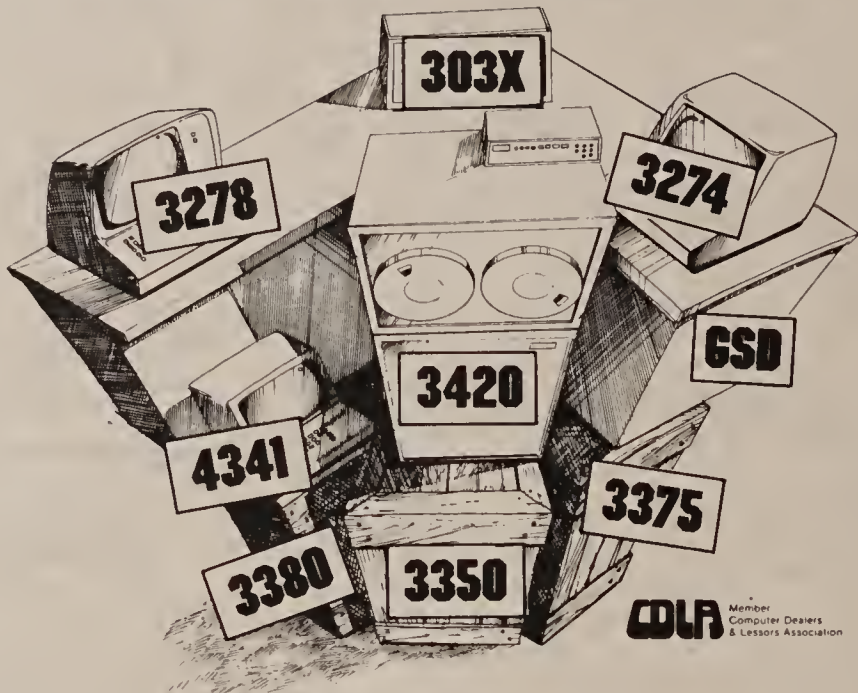
swap

buy

sell

swap

THE HARDWAREHOUSE IS
HARD TO BEAT FOR PRICE
AND AVAILABILITY.



Call Us Collect

UNITED STATES	
Boston: Eastern Regional Headquarters	
Virginia	(617) 272-8110
New York	(703) 525-5233
Washington/Baltimore	(212) 832-2622
Philadelphia	(202) 463-7857
Austin: Southern Regional Headquarters	
Atlanta	(215) 293-0546
Dallas	(512) 451-0121
Houston	(404) 768-6535
Chicago: Central Regional Headquarters	
Pittsburgh	(214) 233-1818
Detroit	(713) 629-4440
San Francisco: Western Regional Headquarters	
Los Angeles	(415) 283-8980
Denver	(213) 670-7994
San Diego	(303) 534-7436
Seattle	(619) 231-2361
Phoenix	(206) 447-1682
Portland	(602) 279-3756
Salt Lake City	(503) 228-7033
CANADA: Toronto	
Montreal	(801) 298-4281
	(416) 366-1513
	(514) 281-1925

BROKER/DEALER SALES AND LEASING
Phoenix: (602) 248-6848

CPU's, Memory	Dave Keane
Peripherals	L.L. Larson
Communications & Terminals	Tim Stone
GSD	George Beck
Leveraged Leasing	Phil Iversen or Wayne U. Smith
Broker/Dealer	L.L. Larson



We've Got
Your Number

S/34	SERIES 1
ALL MODELS QUICK DELIVERIES	CONFIGURED TO YOUR NEEDS
S/36	
ATTRACTIVE LEASE RATES	
S/38	5110/5120
NEW & USED MACHINES	NEW LOW PRICES
PERIPHERALS	
CRT'S..PRINTERS..DISK..TAPE..MODEMS	



COMPUTER SYSTEMS
5105-Q Backlick Road Annandale, VA 22003

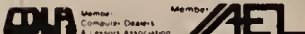
"CALL COLLECT" (703) 642-1950

SERIES/1
CPU's — DISKS
PRINTERS — DISPLAYS
SYSTEM/34-36
SYSTEM/38
SYSTEMS—UPGRADES
PERIPHERALS
BUY—SELL—LEASE

Call Roger Odom,
Gayle Drotar,
or Ken Winzen
901-767-9130



845 CROSSOVER LANE
P.O. BOX 240297
MEMPHIS, TENNESSEE 38124



For Sale or Lease
IBM 3375
DASD
A1's, B1's, D1's
AVAILABLE 12/1/83
Call
NORTH AMERICAN
COMPUTER
(313) 540-6900

FREE
DEC and
DATA GENERAL
Discount Guide
Call or write for your copy TODAY!



Researching
all your options
will show you that
your best source is
COMPUTERWORLD

Buy - Sell - Lease

S/32 IBM
S/34
S/38
3741
3742

CPU's CRT's PRINTERS
ALL MODELS

PURCHASE/LEASEBACK
SHORT & LONG TERM LEASES



Computer Marketing
of America, Inc.
P.O. Box 90907
422 Acklen Park Drive
Nashville, Tennessee 37209



1-800-251-2670
In Tennessee: 615-297-7516

FOR
SALE

Omega III Hybrid Key Telephone system,
2½ years old. Equipped for forty stations and
12 Co's, wired for sixty stations and 20 Co's.
The expanded backplane assembly is in place, only
the printed circuit assembly and stations are
required to expand to the maximum configuration.
There is full feature capability on all stations.
The system is in excellent condition and
looks new in appearance.

For further information,
please contact Jane Creighton



CW COMMUNICATIONS/INC.
375 Cochituate Rd.
Box 880
Framingham, MA 01701

(617) 879-0700

(800)343-6474

Will BUY...SELL...LEASE...
Systems 34/36/38/4300

- Financial Advantage Is Yours Through CPU
- New Or Previous-Owner Processors Available
- Immediate Delivery
- IBM Maintenance
- Create Cash Flow With CPU Purchase/Lease-Back

Call 503/222-2226 Collect

CPU Sales & Leasing, Inc.
3477 Northwest Yeon • Portland, Oregon 97210

MEMBER
AMERICAN SOCIETY OF COMPUTER DEALERS



buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap
-----	------	------	-----	------	------	-----	------	------	-----	------	------	-----	------	------

STOP
YOU'VE FOUND IT!

IBM S/36
IBM S/34
IBM S/38
4331/4341
NEW
4361/4381

- One, Two or Three Year Leases.
- We Buy, Sell or Lease.
- New and Used Peripherals.
- Trade-Ins Welcome.



TexCom
SAN ANTONIO
MEMPHIS • HOUSTON
(512) 349-9955

JOIN THE MORE THAN
150 OTHER MAJOR
COMPANIES THAT
CURRENTLY LEASE
IBM EQUIPMENT
FROM TEXCOM.

SYSTEMS
4341 4331
38 34
36
32 3
BUY • SELL • LEASE
COMPUTER
BROKERS, INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE



TOLL-FREE
800-238-6405
901-372-2622

PERIPHERALS
3203 3370
3340 3411
3350 3420



We Buy & Sell
DEC
Systems
Components

call: 713
445-0082

Digital
Computer
Resale

600 Kennick Ste C22
Houston, Tx 77060

RANDOLPH'S APPROACH TO COMPUTER LEASING... AND WHY IT WORKS.

Started in 1964, Randolph has been saving its customers 30% to 70% of their DP hardware dollars . . .

And we know leasing is still the most financially attractive method of acquiring computer equipment at low cost without draining working capital.

But we learned early that the dollar-and-cents approach to computer leasing is only part of a company's concern. Equally important are: prompt installation . . . dependable servicing . . . flexible upgrade capabilities . . . and full support services. Our commitment to this approach is the key to satisfied customers . . . and our success.



**RANDOLPH . . .
COAST TO COAST**
We presently serve customers in over 300 cities and towns from Maine to Hawaii.



EQUIPMENT ON THE MOVE

We have under management IBM computers with an original cost of over one-half billion dollars . . . and we're adding to this investment to meet the changing needs of our customers. Whether it's an IBM 3081 or 4300 system, additional tape drives, disk storage, printers or other peripherals, our equipment inventory is available to meet your company's requirements. Even hard-to-get machines are sought out and acquired for Randolph customers.

BUT . . . SERVICE MAKES THE DIFFERENCE

The real story behind Randolph's success is our approach to customer support services. To keep computer operations running smoothly and efficiently, these support services have proven to be valuable assets to our customers' D.P. operations.

- Continuous IBM Maintenance Program**
Manufacturer's service is available day or night, seven days a week, to insure optimal use of your system.
- On-Going Technical Support**
Randolph's technical staff is on call to help you reconfigure your system to meet changing data processing requirements.
- Active Remarketing Division**
We assure maximum return on your investment in computer equipment which you no longer use.

MEMBER OF THE FIRST NATIONAL BOSTON FAMILY

In 1972, The First National Bank of Boston purchased our S/360 leasing business, and we became a wholly-owned subsidiary.

With the Bank's financial capabilities behind us, Randolph customers benefit even more from the combined efforts of the best computer leasing and financing people in the United States.

HOW ABOUT YOU?
If your company is not presently leasing computer equipment from Randolph, you'll be interested in our new brochure outlining our special customer support services, and important facts on how we can reduce your computer costs. Call Joseph B. Kelly, Jr., Executive Vice President, 800-243-5307.

537 Steamboat Road
Greenwich, Connecticut 06830
(203) 661-4200 (800) 243-5307

Randolph



THE FIRST NATIONAL BANK OF BOSTON
BANK OF BOSTON

A MEMBER OF COMPUTER DEALERS & LESSORS ASSOCIATION **RANDOLPH COMPUTER CORPORATION** A subsidiary of

FREE! COMPUTER SUPPLIES CATALOG...

The Easy Way To Order Top Quality
Computer And Word Processing Supplies

- Over 1600 items
- Fully guaranteed
- 24-hour order turnaround

CALL TODAY!
1-800-558-6866
ext. 5110



FULL LINE COMPUTER SUPPLIES SINCE 1959



BUY • SELL • LEASE
4300 • S/32 • S/34 • S/36 • S/38
All Peripherals

WANTED TO BUY

5340-E35 • 5360-A12 • 5360-B23 • 5360-B24 •
4331-J02 • 1255-001 • 5251-011 • 5256-003 • 3262-B01 •
3370(S) • 522X(S)

AVAILABLE • SALE OR LEASE

3274-B01(S) • 3274-C01 • 3274-D21(S) • 3274-C51(S) •
3287-002(S) • 5340-C23w/Comm. • 5340-D24w/Comm. •
5256-003 • 5251-011(S) • 5251-012(S) • 5211-001 •
5211-002 • 3279-A02(S) • 8809-A01(S) • 8809-002 •
3275-002 • 3370 #8150(S)

DIVERSE COMPUTER MARKETERS, INC.
28000 Middlebelt Road
Farmington Hills, MI 48018
313-855-5960
With Offices In:
Dallas/Ft. Worth, TX
• James Stephens 817-735-9811
Toronto, Canada • Jack Murphy 416-498-6737



ON TARGET

buy

sell

swap

buy

sell

swap

buy

sell

swap

buy

sell

swap

buy

sell

swap

WANG • DEC

IBM S-I

Disk Drives • Band Printers
Controllers • Peripherals • Media

National Authorized OEM-Distributor
Offers New, Fully Warrantied Equipment

DISK DRIVES			
WANG #	DEC #	CDC #	ERST-CDC PRICE
2280 (V. 6580)-3	RKO 7	9448	\$ 9,400
2265 V-1	RMO 3	9762	8,500
2265 V-2 (6565)	RMO 5	9766	12,900
Prices include installation, 90-day full maintenance (Also available after 90 days), stand, cables, terminator. (Controllers additional.)			
BAND PRINTERS			
WANG #	DEC #	Data Products #	ERST-DP PRICE
2273-1 (300 LPM)	LP 11-A, B	B-300	\$ 5,675
2273-2 (600 LPM)	LP 11-EA, EB	B-600	7,475
Prices include installation, 90-day full maintenance (Also available after 90 days), stand. (Controllers, printer cables additional.)			
SPECIAL MEDIA PRODUCTS OFFER WITH PURCHASE			
WANG #	DEC #	ERST #	PRICE
2280 (6580)	RKO 7	458-4221 Disk Cart.	\$ 156 ea.
2265 V-1	RMO 3	494-4440 Disk Pack	279 ea.
2265V-2 (6565)	RMO 5	490-4574 Disk Pack	642 ea.
2273-1,2	LP 11-A, B, EA, EB	60452 Ribbons (Box of 6)	45.75

*WANG: ERST is the largest dealer in pre-owned WANG equipment —2200, VS, WP (CPUs, Terminals, IOPs, Controllers, Printers, Memory Upgrades).

**IBM Series I: CDC Plug Compatible "Certainty" Series.

ERST

INTERNATIONAL CORPORATION

225 Lafayette Street, New York, NY 10012

CALL TOLL FREE

1-800-FOR-ERST

IN NEW YORK

212-431-1100

IBM SYS/34 - IBM DISPLAYWRITER

BUY—SELL—LEASE

- IMMEDIATE DELIVERY

■ SHORT TERM RENTALS

■ GUARANTEED SAVINGS
- GUARANTEED M/A

■ PERIPHERALS

■ UPGRADES

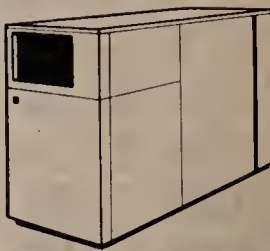
Call ...

MARION

(1-800) 631-1914

(201) 343-4554

(203) 758-2409



84 KENNEDY STREET
HACKENSACK, N.J. 07602

The nationwide market - a call away!

DEC/DG

SYSTEMS/PARTS/PERIPHERALS
NEW/USED/SURPLUS • DISCOUNT PRICES
Since 1977! Buy, Sell, Trade and Broker.

PHIL

DG

BRYAN

11-VAX

JENNIFER

8-LSI

CALL TODAY - (305) 392-2005

TELEX 568-670



thomas business systems, inc.

© 4301 Oak Circle - Unit 11 Boca Raton, Florida 33431

BASIC SYSTEMS HARDWARE,
INCORPORATED CAN:

- Buy your S/34

• Lease you a S/34
- Sell you a S/34

• Save you \$\$\$\$\$\$\$

...A FULL SERVICE...
...HARDWARE HOUSE...

- 3 Mos. FREE Maintenance with Purchase

• Plug thru Peripherals

• Software Support

• Demo Site in Midtown Manhattan
- Upgrades

To Meet Your BASIC HARDWARE Needs, Con-
tact Ken Clarke, Branch Manager, BSH, INC.....
450 7th Ave. NY, NY 10123- 212-279-8107

3370 DISK
3350 DISK
LIMITED QUANTITIES
QUICK DELIVERY

CONTACT:



ECONOCOM

845 CROSSOVER LANE
P. O. BOX 240297
MEMPHIS, TENNESSEE 38124
(901) 767-9130

Inflation Fighters

Quality & Savings

Slightly used, Money Back Guarantee.
Full Reels. All External Labels Removed
Guaranteed for use at 800 BPI through
6250 BPI.

2400' Reel \$4.95 ea.

1200' Reel \$4.25 ea.

600' Reel \$3.50 ea.

All Tapes with Hanging Seals

We pay freight on orders over 200 tapes.

All orders shipped within 48 hours.

Call or Write

Computer Tape Mart

44A Seabro Avenue
N. Amityville, New York 11701
[516] 842-8512

System 38-561

w/5256, (8) 5251's
3370-A11, 3262

Sale or Lease

GTEx

(214) 783-1212

CDL

FOR SALE
INTER-INNOVATIONS
CASH DISPENSERS
MODEL 2770 (NEW)

Original Buyer
Call Frank Cascio
(516) 934-2560

SELLING?

Sell your product or service in Computerworld clas-
sifieds. Join the thousands of advertisers who use our
classifieds because they get results. You can find buy-
ers for discs and DEC's, terminals and timesharing,
software and System 370's. More than half a million
active computer people read Computerworld each
week, and you can reach them efficiently in Compu-
terworld classifieds. To place your ad, or to get a rate
card with complete details on Computerworld Classi-
fieds, call or write:

Classified Advertising

Computerworld

P.O. Box 880

Framingham, MA 01701

1-800-343-6474

617-879-0700

S/38

S/36

S/34

Series 1

Buy...
Sell...
Lease...

- Immediate availability

• 5224 & 5291 • Upgrades

• Short term leases • Trade-ins

• Guaranteed IBM maintenance

CDL



The Datacomp
Leasing & Service
Group, Inc.

Toll Free 800/323-3289

Chicago

312/448-4300

New Jersey

201/467-8686

DATA GENERAL

We Buy, Sell And Service

New And Surplus Systems and Peripherals

Call Or Write

Hanson Data Systems

(outside Mass. toll free)

1-800-225-9216

(within Mass.)

(617) 481-3901

P. O. Box 27, Southboro, MA 01772

BURROUGHS 6810
BURROUGHS 2930
BURROUGHS 1955
BURROUGHS 4800



2480 W Alameda Ave
Denver, Colorado 80223
(303) 922-8331
Telex 910-931-0483

CDL

Member
Computer Dealers
& Lessors Association

buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap
-----	------	------	-----	------	------	-----	------	------	-----	------	------	-----	------	------

CMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET

REGIONAL MARKETING OFFICES

Atlanta, GA (404) 256-7942
Boston, MA (617) 367-5755
California (408) 773-1614
(415) 956-3183 (714) 752-8443
Chicago (312) 693-2790
Dallas, TX (214) 385-0806
Houston, TX (713) 780-7459
New Jersey (609) 645-7282
New York City (212) 349-0718
Tampa, FL (813) 273-8028 or 273-8029
Tennessee (615) 449-6633
Washington, D.C. (703) 442-4941
Geneva, Switzerland Telex: 289950 WTCG
Montreal, Quebec (514) 871-1121
Paris, France Telex: 613910 CMI FR
Toronto, Ontario (416) 673-3081
Vancouver, B.C. (604) 685-6196
Windsor, Ontario (519) 973-3910


CMI FINANCIAL SERVICES GROUP
755 W. Big Beaver, Troy, Mich. 48084
(313) 362-1000

CMI

Since 1969

CORPORATION

755 W. Big Beaver, 19th Floor, Troy, Michigan, 48084
TWX/TELEX: 810 232-1667 CMI CORP TRMI
(313) 362-1000
New CMI 4300 Series Hotline Number: 800-331-4300

A Torchmark Company  Member CDLA

3033-U16

Fully Featured
Available Now
Lease or Sale

USED
3081-D's
or K's

For Sale or Lease

Series 1

New 4956B's, 4967 Disk
Used 4955F's, 4955E's
Immediate Delivery
Buy-Sale-Trade
Leases Available

3033-N8

Fully Featured
Available Now
Lease or Sale

3081/3083/3084

Lease Financing
Available

For Your System or Ours
2, 3, 4 or 5 Year Terms

Series 1 I/O

New or Used
IBM/CDC/Printronic/
Datum/Data South/NEC
Printers - ASC11/3102
180 CPS-1130 LPM
Tape Cassettes - Back-up Unit
Datum 20MB-45MB
Disks - Fixed/Removable
9.3MB-240MB
Buy-Sale-Trade Leases Available

3033

All Upgrades

Wanted
4341-M2
4341-L01

Call Now

3350 3880 3830
3340 3370 3330
3375 3380

Buy/Sell/Lease

Pat Callahan
Tim Ryan

SYSTEM 36

Monthly Lease Rates
Lower Than IBM Credit Corp.
2, 3, 4, or 5 year terms
Includes System 34 takeouts

3725

Lease Financing Available
For Your System or Ours
2, 3, 4 or 5 Year Terms

3800

LASER PRINTERS

Model 1's
Available for Immediate Delivery
Model 3
Lease Financing Available - Any Term
Mary Drangin

8130's

Sale or Lease
Available Immediately
Call Bob Laurie

NEW 5224 PRINTERS

Greater Discounts Than IBM
Leases Available
5224-1 (140 LPM)\$ 165/mo.
5224-2 (240 LPM)\$ 188/mo.
Call For Short Term Rates
Immediate Delivery
Kevin Schaefer

3705-3704

Available for
Immediate Delivery
Sale or Lease
We Can Supply Models E through K
Call Us For Purchase/Leaseback
Of Your MLC Machines
And Save 50% Of Your Monthly Cost

IBM CPU's

3081 3083


3033

4331 4341

sys 38

Call Dataserv Toll-Free when buying,
selling or leasing CPU's or Peripherals
Our numbers speak louder than words

dataserv



509 SECOND AVE. SO. HOPKINS, MN 55343 INTERNATIONAL HEADQUARTERS
TOLL-FREE 800/328-6729 IN MINNESOTA CALL COLLECT 612/933-2575

SYSTEM/34

MODELS E & F

SHORT TERM LEASES


LIMITED QUANTITIES
QUICK DELIVERY

6 MO./TERM
SAVE 25%

12 MO./TERM
SAVE 38%

18 MO./TERM
SAVE 48%

CONTACT:
GAYLE DROTAR



ECONOCOM

845 CROSSOVER LANE
P.O. BOX 240297
MEMPHIS, TENNESSEE 38124
901-767-9130

ALL IBM COMPUTERS ARE CREATED EQUAL
BUT, ALL IBM BROKERS ARE NOT!! CALL US

INTERSTATE COMPUTER EXCHANGE

EXPERTS IN

IBM

BUY • SELL • 72 HOUR UPGRADES

S/34

IMMEDIATE DELIVERY
ALL PERIPHERALS AND FEATURES
40% TO 50% OFF LIST

S/32 • S/38 • SERIES I • ALL IBM EQUIP.
NEW S/23 — LARGE DISCOUNT!!

GUARANTEED !!

IBM MAINTENANCE • DELIVERY DATES

WANTED —

- ALL S/34 CONFIGURATIONS
- ALL S/34 & S/38 PERIPHERALS
- ALL LEASED & OWNED MACHINES

AVAILABLE TODAY -
E 35 to F 37 UPGRADE
128K to 256K, 128 MEG to 256 MEG
COST DELIVERED & INSTALLED \$18,850

7578 TRADE STREET
SAN DIEGO, CA. 92121

CALL
COLLECT


PAUL CAYTON
(619) 578-5410

WANTED TO BUY

DEC EQUIPMENT

VAX And PDP-11

Systems - Components - Peripherals
New Or Used



Meadowlark Enterprises

Essex St.
Middleton, MA 01949
(617)777-4666




SERIES 1

S/34 S/38 S/23

5110 4300

DISCOUNTED MAINTENANCE



XERXES

COMPUTER SALES
Minneapolis, MN 612-339-3042
800-328-3884

FORSYTHE


McARTHUR ASSOCIATES, INC.

DEALER / LESSOR OF IBM
Computers and Peripherals

FOUNDED 1971

Home Office
Chicago
919 North Michigan Avenue
Chicago, Illinois 60611
312 943-3770

Branch Offices
Atlanta 404 953-9457
Milwaukee 414 785-9544



buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap
-----	------	------	-----	------	------	-----	------	------	-----	------	------	-----	------	------

Greyhound Computer Corporation is offering leasing plans for new, non-IBM EDP equipment and high-technology equipment with values in excess of \$100,000. Contact:

- Eastern Regional Headquarters: Mike Coate
(617) 272-8110
- Western Regional Headquarters: Dave Hyland
(415) 283-8980
- Central Regional Headquarters: John O'Shea
(312) 789-9100
- Southern Regional Headquarters: Ron Geil
(512) 451-0121



GREYHOUND COMPUTER CORPORATION
SUBSIDIARY OF THE GREYHOUND CORPORATION

FRONTIER
COMPUTER CORPORATION

Your Full Service
Computer Dealer



DPD
MAIN FRAMES
PERIPHERALS
COMMUNICATIONS

— Call —
FRED HANSEN

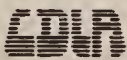
**S/34
S/36
S/38**
AND RELATED
PERIPHERALS

— Call —
RICHARD LORANG

Series/1
• Systems Configured
To Your Specs
• All Features and
Peripherals Available
• Depot Repair Service
— Call —
JOHN BURLEW
RANDY STONE

3270's
3277 • 3278
3274 • 3276
3271 • 3272

— Call —
TERRY SMITH



TOLL FREE 800 - 527-6438 / IN TEXAS 214 - 330-7243
4573 South Westmoreland • Dallas, Texas 75237



DEC

Check out our unbeatable combination—
huge inventory at low, low prices.
Call toll free 800-328-7000
In Minnesota (612) 894-4020

MIDWEST SYSTEMS, INC.
12117 Riverwood Drive, Burnsville, Minnesota 55337

WANTED!

SYSTEM/32

SYSTEM/34

If you have a System/32 or System/34 to sell, we would like to buy it. We are dealing on behalf of already committed buyers and can afford to pay top dollar for your computer.

CONTACT

Mr. Walt Evans
Interstate Medical
Billing
7578 Trade Street
San Diego, CA 92121

Call Toll-Free
800-582-6474

**Buy/Sell/Lease
SWITCHING**

IBM 2914/3814
Locom LCM-500
T-bar 3915/3916
DataSwitch 1000
Beall BCS-3/BCS-5
Digital Ind 3403/4101
Jack McAuliffe
4255 LBJ Freeway #210
Dallas, TX 75234
214-661-3981

DATA GENERAL
New & Used Equipment

**BUY. SELL.
TRADE.**



(313) 583-4100

TLX: 810-232-4866
Answer Back: MCDATAGEN MAHS

McIntyre's
Mini-Computer
Sales Group Inc.
32050 Edward Ave.
Madison Heights, MI

3705

Buy, Sell, Lease
Call Bob Irish
(612) 944-9161
Centron-DPL Company

Hi! Let's talk! We want to tell you about our flexible plans for buying, selling, leasing, renting, purchase/leaseback of IBM System 34 & 38 and 3741/3742. We have a large inventory of CPU's, CRT's, and printers. We'll even talk about System/36!



**Pearl
Computer Division**

• P.O. Box 24026 • 4717 Centennial Blvd.
Nashville, TN 37202 (615) 383-8703

Call John Spight
or Ken Warren

**STC
TAPE/DISK**

BUY • SELL • LEASE
DOUBLE DENSITY DISK
3420 TAPE SYSTEMS
CALL PAM CHRISTIANSEN
(408) 241-3677
Marketex Computer Corporation

MEMORY BOARDS

NEW COMPATIBLE WITH
DEC-DG HARRIS
AND MANY OTHERS

DISK PACKS
ANY MANUFACTURER
FULL DEPOT REPAIRS

DIGITAL DATA SYSTEMS
1551 N.W. 85 Ave., Plantation, FL 33313
305-792-3290
TELEX-232005 ATT DIG

NAS AS/6

Sale or Lease



(214) 783-1212

For Sale or Lease

**IBM 3800-3
PRINTERS**

**NEW ITC QUALIFIED
UNDER 100% of
IBM List Price**

Call
**NORTH AMERICAN
COMPUTER**
(313) 540-6900

IBM

3270

PRINTERS, TERMINALS
& CONTROLLERS
Please Call: (312) 943-3770
Forsythe/McArthur Associates
Inc.
919 North Michigan Avenue
Chicago, Illinois 60611

IBM

**Hardware
Sale**

• 25% Off •

New Datamaster
System 23 Computer
(212) 605-0350

VAX SYSTEMS

Full Turnkey Systems
REP07-AA 28K
6250 Tridensity Tape Drive
W/Formatter & Controller 26K
ERGO-301 (VT-102 Compatible) 800.00
Dataroyal Printers
Fujitsu Disk Drives
Emulex Controllers
UNIX Operating System

**MANDERS BUSINESS
SOLUTIONS, INC.**
(303) 693-3035
2771 S. Jasper
Aurora, Col. 80013

Coastal Computer Marketing

IBM

Equipment

BUY SELL LEASE

Herb Levy
Al Sheldon
(800) 221-4069
(213) 986-4830

RESULTS

Whether you're buying,
selling, swapping, hiring
or looking,
you get results from
Computerworld classifieds.
Maybe that's why Computerworld
gets more classified advertising
than all the other computer
publications put together!

	buy	sell	swap
1	1	1	1
2	1	1	1
3	1	1	1
4	1	1	1
5	1	1	1
6	1	1	1
7	1	1	1
8	1	1	1
9	1	1	1
10	1	1	1
11	1	1	1
12	1	1	1
13	1	1	1
14	1	1	1
15	1	1	1
16	1	1	1
17	1	1	1
18	1	1	1
19	1	1	1
20	1	1	1
21	1	1	1
22	1	1	1
23	1	1	1
24	1	1	1
25	1	1	1
26	1	1	1
27	1	1	1
28	1	1	1
29	1	1	1
30	1	1	1
31	1	1	1
32	1	1	1
33	1	1	1
34	1	1	1
35	1	1	1
36	1	1	1
37	1	1	1
38	1	1	1
39	1	1	1
40	1	1	1
41	1	1	1
42	1	1	1
43	1	1	1
44	1	1	1
45	1	1	1
46	1	1	1
47	1	1	1
48	1	1	1
49	1	1	1
50	1	1	1
51	1	1	1
52	1	1	1
53	1	1	1
54	1	1	1
55	1	1	1
56	1	1	1
57	1	1	1
58	1	1	1
59	1	1	1
60	1	1	1
61	1	1	1
62	1	1	1
63	1	1	1
64	1	1	1
65	1	1	1
66	1	1	1
67	1	1	1
68	1	1	1
69	1	1	1
70	1	1	1
71	1	1	1
72	1	1	1
73	1	1	1
74	1	1	1
75	1	1	1
76	1	1	1
77	1	1	1
78	1	1	1
79	1	1	1
80	1	1	1
81	1	1	1
82	1	1	1
83	1	1	1
84	1	1	1
85	1	1	1
86	1	1	1
87	1	1	1
88	1	1	1
89	1	1	1
90	1	1	1
91	1	1	1
92	1	1	1
93	1	1	1
94	1	1	1
95	1	1	1
96	1	1	1
97	1	1	1
98	1	1	1
99	1	1	1
100	1	1	1

TUBES

- Flexible Layout
- On-time Delivery
- Purchase / Lease / Rent

ascd MEMBER
**AMERICAN
SOCIETY OF
COMPUTER
DEALERS**

METROPLEX COMPUTER COMPANY, INC.
320 Decker Drive • Suite 180 • Irving TX 75062
TWX 910.860.9285

3083
3081
3084
Call For

CDLA Member
Computer Dealers
& Lessors Association

St. Louis, Missouri (314) 727-7010
Houston, Texas (713) 444-0246
Tampa, Florida (813) 963-5556

11448 Pagemill Road
Dallas, Texas 75243
214/343-2904

Offices
and
Distributors
Nationally

[illegible]

The Bulletin Board

Buy • Sell • Lease

Buy • Sell • Lease

Buy • Sell • Lease

Buy • Sell • Lease

WANG

Psssst... WANG USERS.....
HAVE YOU HEARD ABOUT THE GROUP OF FORMER WANG EMPLOYEES IN ATLANTA WHO BUY & SELL USED WANG EQUIPMENT AND PLUG COMPATIBLES?
I.C.A. (404) 977-4388 or 1-800-241-3159

VS Users
WANG 2246-C
(Combined) Work Stations
Reconditioned & Guaranteed
\$3,200 Ea.
(617) 372-8538
CFR Associates, Inc.
"The Wang Alternative"

TIME MANAGEMENT?

EXECUTIVE SECRETARY II. Sophisticated messaging/calendar/meeting scheduling at a fraction of the cost of Alliance for any VS on all work stations.

Send for VS Product List:
Milecomputer Interactive Systems, Inc.
9550 Firstcase Blvd., Downey, CA 90241
24-Hr. Number (213) 882-1605

VS 80 Liquidation

VS 80 256KB Memory, w/Disk, Terminal, Tape & Telecommunication, IOP's
(1) 90MB Disk Drive
(1) 75MB Disk Drive
(1) Tape Drive
(2) 2246S Work Stations
(1) 2246C Work Stations
Sell All Or Part
(206) 885-5656

IBM

For Sale to Highest Bidder
IBM 3031 AP
Computer System
8 MB, Including 3031-3 Processor, 3041 AP, (2) 3017 Motor Generators, 3036 Console and 3850 Data Strm. Bids Accepted By Wright State Univ., Purchasing Dept., Dayton, OH 45435. Until December 1, 1983. Call: (513) 673-2071 or write for Bid Form.

System 32

16K Memory
9.1 Mega Byte Disk
155 Line Per Minute Printer
Make Offer Must Sell
(201) 445-8507
Weekdays 9:00-5:00

For Sale
Quantity of 3278
Model 5's
Any Keyboard
Available Now
Call Mike Brinkman
(714) 850-1033

IBM System 34
Model E35
128K/128MB with Magazine Communication Feature
Under IBM Maintenance
Call (216) 845-6043
Ext. 208 or 211

BUY...SELL...LEASE
S/36 DELIVERIES
5291's, 5224's, 5225's
Available immediately with complete IBM Systems. Call regarding our flexible lease plans as follows:
COLOR DISPLAYS & PRINTERS
Machine: 3279-B02 w/5781, 5782, 4652
Rent: \$185.00/mo.
Purchase: \$4,875.00 *
Machine: 3287-C02
w/3610, 3880, 4450, 5783, 8700
Rent: \$375.00/mo.
Purchase: \$6,400.00 *
* Purchase prices are negotiable
CERES CAPITAL CORP.
New York (212) 279-4467
Houston (713) 627-7724

FOR SALE OR LEASE
64 Meg Upgrade (S/34)
S/34-E35, 5211, 5251-11
S/36
5415-D25 Sys., 3340-A2, 1403, 3741
Series 1 (128K) **WANTED**
5381-581 **S/34 & 36's**
Available Now At A Great Price!
DATAMARC (404) 252-7480
6065 Roswell Rd., Atlanta, GA 30328

IBM

Buy • Sell • Lease IBM

Cougar Computer Corp.
Suite 219
26250 Euclid Office Plaza
Euclid, OH 44132
(216) 261-3500

PRINT TRAINS

IBM 1416 & 3216
Bought - Sold - Lease
Repaired - Reconditioned
COMPU-ACT COMPANY, INC.
(813) 863-2461

Buy Sell Lease
IBM MICR
3890 - 1419
(813) 722-4534

BUY...SELL...LEASE
SYSTEM 34
and peripherals
Available Now
At Huge Discounts
1 Model F35 (256K/M/128MB)
2 Model E35 (128K/M/128MB)
Qty of 5251 and 5291 CRT's
PROCOM
(212) 279-1717

SYSTEM/36's

1983 Deliveries
2 Yr. Or 3 Yr. Leases
We Take S/34 Trade-ins
STAR DATA SYSTEMS
(512) 822-8582

System 34 Mod. E24
with feature
No. 4901, 3701, 3702, 2500, 3500
We'd wish to exchange the above mod. for a larger mod. sys 34 Mod. 35 with feature, 4500 & 4 lines of communication.
Costronics 212-684-0091
183 Madison Ave RM415
New York, NY 10016

System 38
Model 541
69% Of IBM List
Call Ron Gibb
(914) 238-9631

WANT TO BUY
SYSTEM/34's
5211-2 PRINTERS
MIDLAND FINANCIAL
(612) 559-7171

FOR SALE
DATAMASTER
SYSTEM 23
5322 Computer 64K, 5242 H-Density Printer, Manuals, Covers
New/Best Offer
(212) 246-8118
M thru F 10-6

FOR SALE
2501-B2
2701-1 w/7698
3203-5
3211/3811
Call (914) 238-9631
Computer Merchants, Inc.

S/36 MODEL A12
12/9/83 Ship Date
Sell or Lease
Midland Financial
(612)-559-7171

FOR SALE
3411-3 w/7360
3411-3 w/7361
3411-2 w/7003
Call Howard King
(914) 238-9631

IBM

IBM SALE/LEASE
3271-1, 2 (Qty) Avail NOW
6670-2 Avail NOW
1419-1 Avail NOW
3032-6 Avail NOW
3800-1 December
S/34 S/38 43XX
Purchase-Lease Back Programs
VARGO COMPANIES
(313) 254-2850

FOR SALE IBM 2030 CPU

Call Herb Brown:
(305) 873-6088
Eastern Airlines
Miami, FL

HONEYWELL

LEVEL 6 & DPS 6 EQUIPMENT
NEW & REFURBISHED
Systems • Peripherals • Memory
CRT's • Applications Software
SUBSTANTIAL DISCOUNTS!!
Boudreau Computer Services Ltd.
100 Bearfoot Rd.
Northboro, MA 01532
(617) 393-6839
TWX 710-347-7574

DEC

DEC SYSTEM 2060

Four Phase • Model 490
D.G. Nova 3
Compugraphic 8600
• Sale or Lease
• All peripherals - disks, CRT's, tapes, modems, printers, etc.
• Total OEM support
• Complete turnkey facility and office space available near Boston

For Details Please Call
Mr. Robert Nelson or Mr.
Robert Chwaliszewski at:
(617) 961-2700

Systems Architects, Inc.
Thomas Patten Drive
Randolph, MA 02368

DEC BARGAINS

11/34A CPU Set	\$1,585
11/44 KE44-A 'CIS'	\$2,975
4A-MS780-C Spares Kit	\$7,800
BDV11-AA	\$485
DLV11-J	\$395
DR780-AA	\$9,400
DZ11 MUX Brd.	\$1,125
DZ32-B	\$1,870
FP11A	\$1,185
KK11-B	\$2,875
KW11-P	\$330
MS11-MB	\$1,475
MS780-DC	\$4,850
MS780-FD	\$2,985
MSV11-PK	\$1,175
MSV11-PL	\$1,300
PDP 11/34A-DC	\$3,350
RLV11	\$975
RX11-BA	\$1,185
VAX 1MB MS730-CA	\$2,985
VAX 1MB MS750-CA	\$2,985

Call Ray at QEI, Inc.
(617) 275-6800

DEC NEW & USED BUY — SELL — EXCHANGE

Systems • Processors • Memory
Options • Peripherals • Modules
LAKEWOOD COMPUTER CORP.
3260-9 Keller St., Santa Clara, CA 95050
(408) 266-2545

DEC SYSTEMS
11/03 systems w/RL01 disk, LA180 printer., 64KB memory, RT-11 license \$4,500
Complete packaged 11/23 systems with dual RL02 \$12,000
11/03 \$4,250
LA180 ptrs. w/interface & cntrfr. \$375
Other Configurations CALL
E.E.C. Systems Inc. (617) 443-5106

DEC

FOR SALE OR LEASE
PDP-11/70
1MB, 2-RP06,
TE-16, RSTS/E
Short lease available
Contact Bruce Douglass
(916) 381-1649

DEC & PRIME SPECIALS
• VAX 16 MB Upgrades, Call For Quote
• CDC 9775 Unused, \$16,000
• CDC 9766, Call For Quote
• CDC 9762, Call For Quote
• PDP 11/04, 11/34-Avail. Now
• RUA 81CA, Call For Quote
• Prime Computer Systems Available Upon Request
SEVCO INC. (617) 435-8936

BUY • SELL • TRADE

1134A.....	\$3995	M9312.....	\$ 395
BA11-KE.....	\$1995	RH780.....	\$2995
DUV11-DA.....	\$ 700	RP04/6-C.....	\$2995
DZ11-C.....	\$1950	RX211-BA.....	\$2000
H9642.....	\$ 975	TM11-EA.....	\$1675
M7258.....	\$ 395	TU16-EA.....	\$5500

NEW YORK COMPUTER EXCHANGE
(516) 752-8666 (800) 645-9109

Your ad can be
seen here
for just \$115.

BURROUGHS

BUY SELL LEASE All Systems & Peripherals AVAILABLE

• B1855 Sys • B1955 Sys
• B90s • B900s
(Configured To Your Specs.)
SPECIAL: B1955 MEMORY
• SRI Terminals model 100 & 110
• TD830s, MT983s, MT985s
• 206 & 207 Style Disk Drives
• Various Tape Sub-systems
• Memory Upgrades
• Printers 9246 & 9249 Styles
Guaranteed Burroughs Maint.
Depot Maintenance Available
COMPUTER PROVISIONS
(216) 248-7878
(Member IBDA)

For Sale Burroughs Line Printer

B-9247-2 400 LPM
With Controller
Make Offer
Call DP Mangaer
(717) 274-2571

HEWLETT PACKARD

HP 3000
BUY & SELL
Complete Systems
Memory • Terminals
Disk Drives • Tape Drives
Miscellaneous Parts
ConAm Corporation
(Formerly Finley & Associates)
(800) 643-4954
(213) 456-2843

HP 1000 & 3000 Systems
We Buy & Sell
Complete Systems & Peripherals
Hugh Inventory
Encore Industries
1513 Sixth Street, Ste. 203
Santa Monica, CA 90401
(213) 393-8268
7 AM - 4 PM Pacific Time

HP 3000
BUY-SELL-LEASE-TRADE
Immediate Shipment
Systems, Terminals
Peripherals, Parts
Guaranteed HP Maintenance
MSI MICROTEK
216-234-8040

HEWLETT PACKARD

AVAILABLE IMMEDIATELY
Series 64
Call For Details
Windemere Systems Corp.
1-800-638-8795
(301) 948-2684

Buy-Sell-Lease
HP3000 3X, III, 4X
and related peripherals
Call Carol
CSU INDUSTRIES, Inc.
516-239-4310

NCR

SPREADSHEET SOFTWARE

IDPS/IMOS \$450 IRX \$495 VRX \$1000
30 DAY TRIAL - \$75
SOFTWARE PRODUCTS CO.
P.O. Box 18814
Wichita, KS 67218
(316) 682-1762

DATA GENERAL

MV 8000/6000 2 Mb Memory Boards Available Now Liberal Trade In On Your Old Boards

M-600 1/2 Mb System	\$18,000
C-350 1/2 Mb System	\$15,000
MV-8000 2 Mb System	Call
MV-6000 2 Mb System	Call
8392-H Nova 4S 64 Kb	\$5,800
w/6045 & Lowboy Cab	
8395-N Nova 4X 256 Kb	\$13,500
w/6046 (20 Mb) & Cab	
8591-N Nova 3D 256 Kb	\$7,500
ULM 5, 6046 & Cab	
6070 20 Mb Disk Subsystem	\$4,200
6060 96 Mb Disk Subsystem	\$12,000
6061 192 Mb Disk Subsystem	\$14,800
9500 Systems Industries Cntrl	\$950
9762 CDC 80 Mb Drives	\$4,200
8656 Eclipse 256 Kb Memory	\$2,950
8687 S140 256 Kb Memory	\$2,950
8387 Nova 4X 256 Kb Memory	\$2,950
6053 CRT Terminal	\$975
6026 800/1600 Tape S/S	\$10,500
6099 12.5 Mb Disk S/S	\$2,500
8708 2 Mb MV 8000 Memory	Call
8703 512 Kb MV 8000 Memory	Call
4215 600 LPM Printer	\$5,300

Int'l. Computing Systems Co.
(612) 941-2941

MISC. SYSTEMS

DATA 100 EQUIPMENT

3 Complete Systems for Sale
For More Information Call:
Rod Shogren
(206) 447-7732

USED PRIME 300 MINICOMPUTER SYSTEM
From the Holliston, MA School Department. Equipment, memory and storage capable of performing most business and industrial functions with proper software.
For Information Call (617) 429-5450
Additional peripheral equipment such as disc drives also available.

DATAPoint
EQUIPMENT TO SELL
3800 (128K) Processors, 6040 Processors, 9602 Letter-Quality Printers, 9622 Matrix Printers.
2-3 Years Old
Excellent Condition
(517) 373-4570

MISC. SYSTEMS

Complete Office System
Onyx 40 MB with Tape Backup
(4) Terminals and (1) Printer.
Medical Management Software
OASIS Small Multi Users
Languages, Word Processor and Utilities Included.
Value Equals \$32,250
Will Sell For \$19,500.
Call Greg (402) 483-4721 (days).

FOR SALE
NORTHERN TELECOM
SYSTEM 445
256K, Guardian, Cobol Compiler, 8 Terminals, DM80 75MB Removable Disk, 300LPM GE Printer.
Immediate Availability
Always Under NT Maint.
GPPAW Employers Retiree Trust
Call (813) 936-6242

SPERRY UNIVAC

V-77 800 SYSTEM
(2) 256K CPU w/2 Pages WCS
(2) 8433/20 200 MB Disk Drives
(4) 10 MB Disk Drives
(2) 800 bpi Tape Drives
(2) 800/1600 bpi Tape Drives
(1) 300 LPM Printer
(1) 600 LPM Printer
THE EXCHANGE (206) 844-7000
Ask for TOM BASS

DISK DRIVES AND PACKS

Head Crash

Drop Packs
Fixed Or
Mountable Disks
Need This Data?
Data Retrieval
(213) 986-4830
(800) 221-4069
Tony
Call For Estimate

MISC.

Buy • Sell • Lease
DATAPoint
Cougar Computer Corp.
Suite 219
26250 Euclid Office Plaza
Euclid, OH 44132
(216) 261-3500

BUY - SELL - LEASE
DATAPoint
HARDWARE & SOFTWARE
• Turnkey Systems • FAMIS Software
On-Line Accounting
(713) 529-9813

For Sale
PCI 1051 Protocol Converter
For System 34/36/38
3 Ports, \$3,000
Contact Larry Wood
(203) 561-0321 or
(203) 567-0801 ext. 39

FOR SALE
MEMOREX 3330
Equipment
Call Herb Brown
(305) 873-6088
Eastern Airlines
Miami, FL

SOFTWARE FOR SALE

Changing Computers? Retain your SOFTWARE INVESTMENT

Dataware's conversion approach provides the solution to management's conversion problems and facilitates the recovery of the initial capital investment in systems development.

- COBOL to COBOL
- AUTOCODER/SPS to COBOL
- EASYCODER/TRAN to COBOL
- BAL/ALC to COBOL
- OOS/ALC to OS/ALC
- PL/I to COBOL
- RPG/RPG II to COBOL
- RPG/RPG II to PL/I

Faced with Conversion?
Call or write today

The Conversion Software People
Dataware, Inc.

2565 Elmwood Avenue
Buffalo, New York 14217
Phone (716) 876-8722
TELEX: 91519



Elegant Software for IBM S/34, 36 and 38

General Accounting	Payroll/Personnel
Financial Reporting	Property & Equipment
Accounts Receivable	Report Writer
Accounts Payable	Oil & Gas
Order Processing	All Systems are:
Inventory Management	RPG II/RPG III
Sales Analysis	Data Base
Job Cost	Interactive

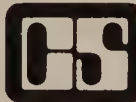
J.D. Edwards & Company
4949 South Syracuse Street/Suite 5500
Denver, CO 80237
303/773 3732

Dallas — 214/ 458 0636
Houston — 713/ 880 8278
Northern California — 415/ 697 7754
Southern California — 714/751 5302

VAX PDP-11 Application Software

- General Ledger
- Accounts Receivable
- Accounts Payable
- Payroll
- Job Cost
- Order Entry
- Inventory
- Fixed Assets
- Client Writeup
- Automatic Restart
- Tailorable
- Multiuser
- Multitasked ISAM
- RMS Files
- Support Hotline
- Security System
- User defined Forms
- Fully Documented

- Phone Demonstrations
- \$1,000 to \$3,500/module



Compu-Share
3824-50th Street
Lubbock, Texas 79413
(806)792-3785

Now available on TYMNET

Financial Planning, General Ledger, Accounts Payable, Accounts Receivable for IBM SYSTEM/38



INSIGHT

Insight Software Systems, Inc.
One N. Broadway, White Plains NY 10601 914 682-4910

Chicago 312 693-6300 Houston 713 664-2132 Los Angeles 213 451-5781

EXEDIT

At last, a fast & powerful
editor for your EDX

IBM SERIES/1

Faster & more powerful
than the latest \$FSEDT.
Works on EDX V3 & V4;
4978/79 or 3101B.

★ Demo Diskette Available ★
\$565 per S/1

H & A Computer Systems
30 Hotelling Place #204
San Francisco, CA 94111
(415)434-3517

SERIES/1 SPECIALISTS

**FAST
CODE**

For

System/38

Cuts Coding Time
80%

Increases Programming
Output 25%

Get Details and FREE User Guide

CALL TOLL FREE

1-800-328-1000 Ext. 125

HELP/38

15102 Minnetonka Industrial Rd.
Minnetonka, MN 55343
Division of Advance Circuits, Inc.

BUILDING BLOCK SOFTWARE FOR IBM SYS/38 READY TO GROW

Choose your building blocks from
these applications, which operate
individually or in combination:

DISTRIBUTION

- Order Processing
- Billing
- Sales Analysis
- Inventory Control and Purchasing

MANUFACTURING

- Product Structure
- Product Standard Costing
- Inventory Control and Purchasing
- Master Production Scheduling
- Material Requirements Planning (MRP)
- Shop Floor Control and Costing
- Capacity Requirements Planning

FINANCIAL

- Accounts Receivable
- Accounts Payable
- General Ledger

**RMS/38 ALL
THE SOFTWARE
YOU'LL EVER NEED**

PCR's Resource Management
System (RMS/38) is all the soft-
ware you'll ever need to unleash
the power of the IBM System/38.

An all-native mode application
system, its modular "building
block" design lets you build a
comprehensive data base
management system with a full
range of integrated applica-
tions. As your needs change,
you can expand RMS/38 to

meet them. Without
extensive modifi-
cations or high
programming
costs.

**CALL FOR
DETAILS
312-
932-2200**

PCR
2021 Midwest Road
Oak Brook, IL 60521

**professional
computer
resources**

THE WAIT IS OVER. B.I.D.S. UNLEASHES THE POWER THROUGH HEWLETT-PACKARD COMPUTER SYSTEMS . . .

B.I.D.S. (BUSINESS INTEGRATED DATA SYSTEMS)

1. G/L — General Ledger	\$ 2,500.00
2. A/R — Accounts Receivable	\$ 3,500.00
3. A/P — Accounts Payable	\$ 3,500.00
4. PO — Purchase Order	\$ 2,500.00
5. INV — Inventory / Order Entry	\$ 3,000.00
6. P/R — Payroll	\$ 2,500.00
7. FA — Fixed Assets / Equipment Maintenance	\$ 2,000.00
10% Discount when Total B.I.D.S. Purchased	- 1,950.00
Demo Tape with Documentation	50.00
Total for All Modules within B.I.D.S.	\$17,600.00

**VALLEY
DATA BASE**



50 East Evan Hewes Hwy. / P. O. Box 2655 / El Centro, CA 92244 / (619) 353-0410

SYSTEM/36 NOTICE

Scope Publications is now
publishing SCOPE/36, the
technical journal for the IBM
S/36. For sample issue con-
tact:

Scope Publications, Inc.
Dept. S36-C
P.O. Box 1252
Maitland, FL 32751
(305) 645-2351

IBM PC BASIC FOUR TERMINAL EMULATOR

- Complete emulation of MAI
Basic Four 7270 VDT
- Data transfer to/from PC
- Local print on PC printer
- Basic Four Software included

PRICE \$300 (U.S.)

**SIGMA COMPUTER
RESOURCES**

801-1155 West Georgia Street
Vancouver, B.C., Canada
V6E 3H4 (604) 688-8271

Basic Four is a trademark
of Management Assistance Inc.

General Ledger System For VAX

Have problems getting timely reports from your
accounting system? Need better control over your
financial reporting? Use PLYCOM's General
Ledger Package for accounting software that is
easy to use, yet effective. Includes excellent sup-
port, complete documentation and:

- Easy to use menus
- Completely interactive
- Excellent audit trail
- User defined ledger codes
- Budget reporting
- Historical reporting
- Departmental reporting
- Flexible consolidations
- User defined financial reports
- Multiple financial statements
- Detail or summary data retention
- On line account inquiry
- Interfaces to Payables, Receivables
and Fixed Assets Packages
- For VAX/VMS

Plycom services, inc.
P.O. Box 380465
San Antonio, TX 78280
(512) 734-4366

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's
Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Ser-
vices, Software for Sale, Position Announcements and Buy/Sell/Swap.
(Available upon request: Software Wanted, Turnkey Systems and Real
Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN
typewritten copy. Figure about 25 words to a column inch, not including
headlines.

Cost: Our rates are \$112.70 per column inch. (A column is 2" wide.) Mini-
mum size is two column inches (2" wide by 2" deep) and costs \$225.40
per insertion. Extra space is available in half-inch increments and costs
\$56.35. Box numbers are \$15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an
account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: _____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____ Title: _____

Address: _____

Telephone: _____

Send this form to:

**CLASSIFIED ADVERTISING,
COMPUTERWORLD**

375 Cochituate Road, Box 880, Framingham, MA 01701

TIME & SERVICES

Computer & Memory Repairs

Any Manufacturer's Memories
CORE.....SEMI

DEC®—DATA GENERAL
Complete CPU'S and Memories

T

D

C

THREE DELTA CORP.
1038 Kiel Court, Sunnyvale, CA 94086
(408) 734-2680 TWX 910-339-9511

NV

NESHAMINY VALLEY
INFORMATION PROCESSING INC.

OFFERS THE POWER OF
ONE IBM 3081 (XA)
THREE 3033'S (MVS)
AND TWO 158-3'S (AP)
3800 LASER PRINTING

OPERATING SYSTEMS: MVS, JES2,
VM, DOS/VSE, VSE/POWER VS1
INTERACTIVE: TSO, SPF, WYLBUR,
ROSCOE, CICS, CMS, CMS/SPF
REMOTE BATCH: RJE,
BISYNC, SDLC, ASYNC
NATIONWIDE
COMMUNICATIONS NETWORK
COMPILERS: COBOL, FORTRAN,
PL1, PL10PT, PASCAL/VS, RPG,
BASIC, APL, DUO
APPLICATION PROGRAMS: SAS,
SAS GRAPH, TELEGRAPH/DISPLA,
ADRSII, IMS, IDMS, EASYTRIEVE,
QUIKJOB, SYNC SORT, FDR,
LIBRARIAN, UNCLE (CROSSTABS)
AVAILABLE 24 HOURS PER DAY,
7 DAYS PER WEEK
COMPLETE TECHNICAL SUPPORT
VERY COMPETITIVE PRICES
CONTACT YOUR NEAREST
NVIP SALES OFFICE
PHILADELPHIA: 215-322-3314
NEW YORK: 212-684-7640
WASHINGTON: 703-522-0888

\$

TURN YOUR ACCOUNT RECEIVABLES
INTO IMMEDIATE CASH.

\$

THOMAS buys your invoices and gives you CASH in 24 hours or less.

\$100.00 to \$100,000.

You no longer have to wait 30, 60 or more days for your money.
Get It Today. The THOMAS Way.

- NO FINANCIAL STATEMENTS REQUIRED
- NO CONTRACTS TO TIE YOU DOWN
- NO WAITING TIME

Take advantage of our service today. get cash tomorrow!

Thomas Funding Corp. Offices in principal cities

Mr. R. Farkas—N.Y.C., N.Y. (212) 679-4300
Out of state use our Toll Free number 1-800-221-3136

\$

ICOTECH
Innovative Computer Techniques

COMPUTER SERVICES
IBM 3081 DEC-10

- Remote Job Entry
- Batch Processing
- Optical Mark Reading
- Online Processing
- Timesharing
- Laser Printing

COMPUTER OUTPUT MICROFILM

- Datagraphix Mini Auto-Coms
- Datagraphix Datamaster
- 6250 BPI Capability
- Free Testing

Route 202
Raritan, NJ 08869
201-524-0153
Contact: Joyce Bogaenko

COMPUTER TIME
FOR SALE

IBM 4331

All Shifts Available
7-3420s MOD-5, 1403-N1,
2540

From \$50/Hour

Restaurant Associates, Inc.
1540 Broadway
New York, N.Y. 10036
Contact:
Al Palmo (212)997-1411

DATA CENTER SERVICES

—★—

TWO (2) 3033U16

- ★ OS/MVS/SP
- ★ VM/370
- ★ DOS/VSE/SCP
- ★ CMS
- ★ TSO/SPF
- ★ CICS
- ★ IMS/DBDC
- ★ RJE

★ TELENET ACCESS

Info Center Products
Access By Micros

EXCELLENT SERVICE LEVELS
COMPETITIVE RATES
VOLUME DISCOUNTS

BURNS

COMPUTING
SERVICES, INC.

MIDWEST: 312/981-5260 EAST COAST: 215/398-3600

New York
REPAIR DEPOT INC.

THE FULL SERVICE SOURCE

REPAIR SPECIALISTS

Computer Boards • Memories
Peripherals • Cash Register Systems
ALL MANUFACTURERS

SALES

Used DEC Equipment At Spectacular Prices
Bought & Sold • Fully Guaranteed

REAL COST SAVINGS

SUPER FAST TURNAROUND

22 West 23rd Street, New York, N.Y. 10010
212/741-3800

DEPOT COMPUTER REPAIRS

DEC-DG
ALL BOARDS
1-2 WEEK TURNAROUND

MEMORIES
POWER SUPPLIES
DISKS PACKS AND TERMINALS
ANY MANUFACTURER

DIGITAL DATA SYSTEMS, INC.

1551 NW 65 Ave. Plantation, FL 33313

305-792-3290
TELEX-232005 ATT DIG

CURTIS
WHITENT

Computer
Services

4341-2 370/158-3

VS1-CICS-ROSCOE-DOS

REMOTE JOB ENTRY
CICS DEVELOPMENT
CICS PRODUCTION
CUSTOMIZED SOFTWARE

CONTACT JOE BARRETT
(201) 777-3454

15 MINUTES FROM LINCOLN TUNNEL
ONE PASSAIC STREET
WOOD RIDGE, N.J. 07075

VAX AND PDP
DEVELOPMENT TIME

NO KILOCORE TICK CHARGES / NO CPU CHARGES

Omnicomputer™

\$7/\$14

RSTS/E VMS

PER HOUR
CONNECT TIME

BUDGET
BYTES™

212-
944-9230

Omnicomputer, Inc.
1430 Broadway, New York, N.Y. 10018

COMPUTERWORLD CLASSIFIEDS WORK!

- POSITION ANNOUNCEMENTS
- BUY SELL SWAP
- SOFTWARE
- SOFTWARE WANTED
- TIME & SERVICES
- REAL ESTATE
- BUSINESS OPPORTUNITIES
- SEMINARS/CONFERENCES
- BIDS AND PROPOSALS

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or camera ready mechanical, stat or film negative of your ad, just call one of our ad-takers at 1-800-343-6474. They will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (teletype service is available); note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with you insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

Ad closing is every Friday,
6 working days prior to issue date.

Rates: Open rate is \$112.70 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs \$225.40 per insertion. Additional space is available in half inch increments. Some sample sizes and costs are shown.

- 1 col X 4" - \$450.80
- 2 cols X 4" - \$901.60
- 2 cols X 5" - \$1127.00
- 2 cols X 8" - \$1803.20

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available, \$15 per insertion.

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

- Boston - (617)879-0700
- New York - (201)967-1350
- Chicago - (312)827-4433
- San Francisco - (415)421-7330
- Los Angeles - (714)556-6480

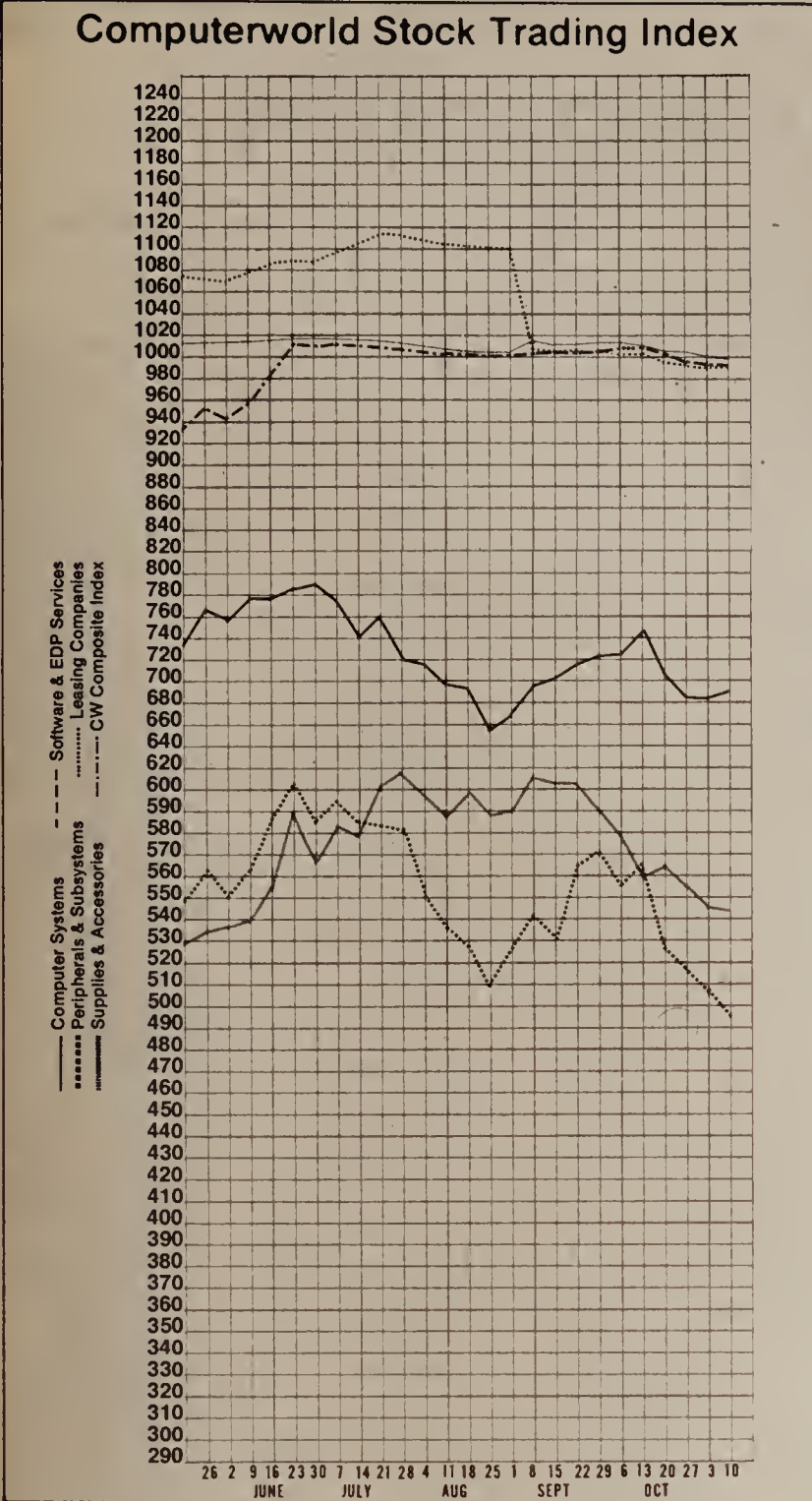
TELECOPIER SERVICE - (617) 879-0700

William J. Mills, Manager Classified Advertising



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
375 Cochituate Road, Box 880, Framingham, MA 01701/(617) 879-0700



Computerworld Sales Offices

Vice-President/Sales/Donald E. Fagan
Director/National Sales/Edward P. Marecki
Marketing Support Manager/Kathy Doyle
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701
(617) 879-0700

BOSTON SALES OFFICE (617) 879-0700
Northern Regional Manager/Chris Lee
District Managers/Jim McClure, Ronald Mastro,
Jayne Donovan, Michael F. Kelleher
Sales Assistant/Alice Longley
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701

CHICAGO SALES OFFICE (312) 827-4433
District Managers/Arthur Kossack,
H. Newton Barrett, III
Sales Assistant/Jean F. Broderick
Northern Regional Manager/Chris Lee
COMPUTERWORLD, 2600 South River Road, Suite 304,
Des Plaines, IL 60018

NEW YORK SALES OFFICE (201) 967-1350
Eastern Regional Manager/Michael Masters
Sr. District Manager/Doug Cheney
District Managers/Ray Corbin, Joan Daly
Account Executive/Fred Lo Sapio
Sales Assistant/Gale M. Paterno
COMPUTERWORLD, Paramus Plaza I,
140 Route 17, North, Paramus, NJ 07652

LOS ANGELES SALES OFFICE (714) 556-6480
District Managers/Bob Hubbard, Bernie Hockswender
COMPUTERWORLD, 18008 Sky Park Circle, Suite 260,
Irvine, CA 92714

SAN FRANCISCO SALES OFFICE (415) 421-7330
Western Regional Manager/William J. Healey
Account Managers/Barry Milione, A.G. Germano,
Theodora Franson, Ernest Chamberlain
Account Manager/Classified/Nicole Boothman
COMPUTERWORLD, 300 Broadway, Suite 20,
San Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0758
District Manager/Jeffrey Melnick
Eastern Regional Manager/Michael Masters
COMPUTERWORLD, 1853 Peeler Road, Suite D,
Atlanta, GA 30338

CLASSIFIED ADVERTISING (617) 879-0700
Al DeMille, Bill Cadigan
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701

CW INTERNATIONAL MARKETING SERVICES
Manager/Diana La Muraglia
COMPUTERWORLD, 375 Cochituate Road, Box 880,
Framingham, MA 01701
(617) 879-0700

For foreign sales offices, see Page 2.

CW COMMUNICATIONS/INC.

Board Chairman/Publisher
Patrick J. McGovern

President
W. Walter Boyd

Senior Vice-President
Lee Vidmer

Group VP-Communication Services, Jack Edmonston. Group VP-Circulation, Margaret Phelan.
VP-Marketing, Donald E. Fagan. VP-Finance, William P. Murphy. VP-Editorial, John Whitmarsh.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701
Phone: (617) 879-0700, Telex: 95-1153.

SALES **Vice-President, Donald E. Fagan. National Director, Edward P. Marecki. Corporate**
Advertising Administrator, Frank Collins. Marketing Support Manager, Kathy Doyle.
Display Advertising Supervisor, Anne Hadley.
Display Advertising, Deborah Bryer, Pam Valentinas, Elaine Carlos, Carolyn
Medeiros, Cindy Chekas. Classified Advertising Manager, William J. Mills.

COMMUNICATION SERVICES **Group Vice-President, Jack Edmonston. Director Research, Kathryn Dinneen.**
Sales Promotion Manager, Noreen Kimball.

PRODUCTION **Production Director, Peter Holm. Production Manager, Marlene Stibal.**
Supervisor, Trish Gaudette. Systems Manager, Tom Pfau.
Typesetting Manager, Carol Polack. Art Director, Tom Monahan.

CIRCULATION **Group Vice-President, Margaret Phelan. Circulation Manager, Barbara Jeannetti.**
Service Representative, Peggy Kelly. Assistant, Carmela Priante.

Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information.

ADVERTISERS INDEX

Admiret.....	76	Duquesne Systems Inc.....	42	Northern Telecom.....	122-123
AFIPS.....	150	Dynacalc.....	62	On-Line.....	167
Aluminum Case Co.....	ID/5	Eastman Kodak Co.....	ID/25	Pace Applied Technology.....	85
Amdahl.....	101	Electrohome.....	ID/40-ID/41	Pansophic Systems.....	77
American Key Data.....	ID/11	Exxon Office Systems.....	89	Parallax Systems.....	86
American Software, Inc.....	ID/6	Ferox Microsystems, Inc.....	133	PC World.....	166
Anderson Jacobson.....	32	Fibronics.....	106	PC World Expo.....	126
Apollo Computer.....	40-41	Forte Data Systems.....	162	Plexus Computer.....	113
Applied Digital Data.....	145	Fox Reserach.....	31	Prime.....	124-125
Applied Software, Inc.....	ID/35	Fusion Products.....	147	Protocol.....	106-107
AT&T Info Systems.....	114-115	General Electric.....	69	Quadrex Corporation.....	ID/10
Auragen.....	ID/9	Gould Inc.....	36	Quality Microsystems.....	ID/52
BASF.....	ID/51	Graham Magnetics.....	49	3R Computers.....	4
BBN Computer.....	58-59	Group Operations.....	ID/16	Radio Shack.....	ID/21
John Beall Company.....	151	GTE BCS.....	118-119	Ross Systems.....	72
BGS Systems Inc.....	ID/48-ID/49	H & W Computer Systems.....	ID/4	SAS Institute.....	ID/28-ID/29
B I Moyle Associates, Inc.....	86	Hayes Microcomputer.....	108	Saudi Reserach & Marketing.....	ID/7
Boeing Computer.....	ID/36	Hewlett Packard.....	20-21,65	SDI.....	ID/7
Braegen Corp.....	159	Hughes Aircraft.....	56	Signal Technology.....	61,62,63,64
M. Bryce & Associates.....	ID/27	IBM.....	39,160-161	Softech Microsystems.....	132
Burroughs.....	ID/43	IITRI.....	28	Software A G.....	99
Bytel Corp.....	ID/46	Infodata.....	7	Software Dynamics, Inc.....	ID/34
Cecom, Inc.....	ID/4	Inforex.....	26	Software Express.....	16,17
Cincom.....	50-51	Information Science Inc.....	82-83	Software International.....	43
CMi.....	144	Innovative Electronics.....	ID/25	Sorcim.....	74-75
Codex Corp.....	12-13	Interactive Training Systems.....	97	Southern Systems.....	ID/11
Comnet '84.....	120	International Market Center.....	18	Sperry Corp.....	73
Comnet.....	ID/34	ITT Courier.....	54-55, ID/1	SPSS.....	27
Computer Associates.....	100	ITT Industrial.....	88	STC Systems.....	33
Computer Automation.....	81	Kaypro.....	14-15	Sterling Software Marketing.....	ID/42, ID/47, 134
Computer Corp. of America.....	37	Kierulff.....	ID/44	Stone Mountain Computing.....	71
Computer Tech Group.....	ID/24	K/W Control Systems.....	8	Synapse Computer.....	19,55
Compuware.....	98	J.W. Lampi, Inc.....	91	Synsort.....	3
Comsite International.....	109	Lee Data Corp.....	116	Sysed.....	ID/27
Context MBA.....	48	Local Data.....	96,109	Systems Support.....	96
Continental Resources.....	87	Lotus Development Corp.....	129	Tandberg Data.....	164
Control Concepts.....	ID/4	3M.....	30,141	Techland.....	6
Control Data-LPD.....	29,80	Madzar.....	109	Technology Transfer.....	61
Corodale.....	92	Management & Computer Services.....	47	Technical Analysis Corp.....	130-131
CPI.....	65	Manager Software Products Inc.....	102	Tektronix Inc.....	22
CPX.....	137	Martin Marietta.....	94-95	Term-Tronics.....	70
Cullinet.....	57	Mathematica.....	ID/17-ID/20	Texas Instruments.....	140
Curtis 1000.....	ID/26	McCormack & Dodge.....	110-111	3COM.....	ID/38-ID/39
CW China.....	63	Megatek.....	148	Tone Software.....	96
CW Supplement.....	143	Memorex.....	ID/12-ID/13, 169	Tower Systems.....	156
CW Sweden.....	134	Memorex CTD.....	52	Triangle Software.....	ID/5
DASD.....	142	Microp Age.....	142	Unicalc Corp.....	156
Data Access.....	168	Micro Focus.....	66-67	Uniforum.....	136
Data Design Assoc.....	53	Microage.....	142	United Information Services.....	ID/22-ID/23
Datagram.....	104	Microdata.....	44	Universal Data Systems.....	46
Datamation.....	ID/43	MicroFrame.....	28	U.S. Robotics, Inc.....	23
Data Processing Design.....	ID/8	Mini & Micro Educational Services.....	51	USPS.....	24
Datapro Research Corp.....	38	MSA.....	34-35, 204	Value Computing.....	84
Dataproducs.....	105, 121	MSI Data Corp.....	128	Verbatim.....	60
Data Rental Sales.....	117	MVC Associates.....	96	VM Software, Inc.....	93
Datasouth Computer.....	154-155	National Semi Conductor.....	ID/50	Wang Laboratories.....	127
Data Storage Solution.....	ID/30	NCR Comten, Inc.....	90-91	Whitesmith.....	109
Datastream.....	ID/14	NCR Corp.....	153	Winterhalter Assoc.....	71
DEC/CMS vac.....	138-139	NEC.....	ID/32, 146-147	Wolongong Group.....	163, 165
Deltak.....	112	NEC Telephones.....	45	Xerox Corp.....	ID/31
Deltak, Inc.....	152, 157	Netec.....	64	Yorndon.....	5
Dialogic Systems.....	25	Nixdorf Computer Corp.....	135	Zytron.....	158
Digital Controls Corp.....	ID/35				
D.J.C. Corp.....	72				
Dorlen Products.....	ID/42				
DP Facilities.....	28				

15 pointed questions to ask MSA or any software supplier

These questions will help you when you sit down with individual software companies.

They're tough questions. Relevant ones. And any supplier who is worth his salt should be able to answer them without backpedaling.

Ask MSA

We'll answer all these questions to your satisfaction—plus any others you may have.

In fact, we're probably the best equipped to answer them. Because MSA is *the* software company. We offer the most complete line of totally integrated systems in the software industry, including financial, human resource and manufacturing.

So you avoid the headache of trying to tie together individual systems. (And the even bigger headache of adding to them.)

With MSA's integrated systems, there's no unnecessary duplication of data or effort. Reporting is faster. All your company's information is more timely and accurate—and in the right form.

Our technical edge comes from experience

Staying ahead is easier for a company that's steeped in software technology. MSA has spent years developing, refining, testing and enhancing our systems.

This year alone, we'll invest \$25 million to make sure all our systems are technologically razor sharp. That gives us a decided advantage over flash-in-the-pan technology that may not have the bug-free logic of a more experienced system.

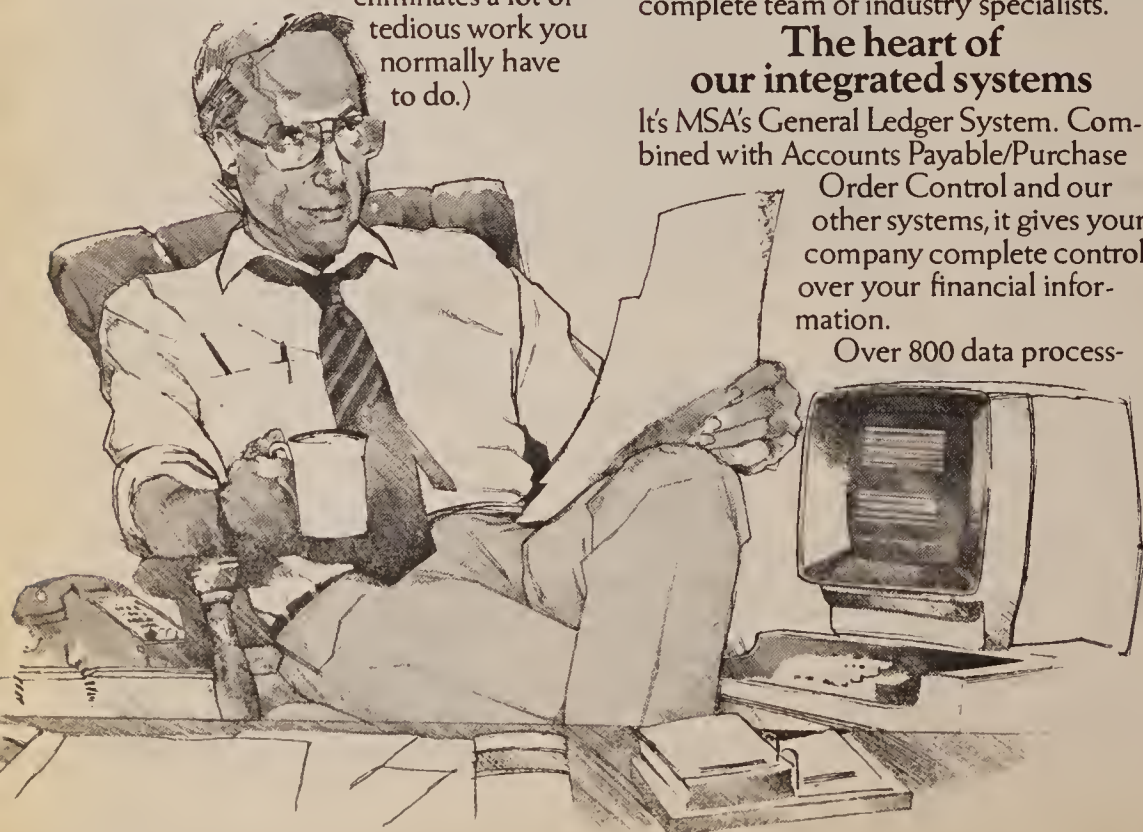
It also gives you a decided advantage over "custom" systems you have to update yourself.

MSA relieves you of that time-consuming burden. We update and enhance your software for a full year. Then we continue this service for a surprisingly low annual fee.

Maintenance includes keeping your system up-to-date technologically. Enhancing it with new features that make it work even harder for you.

And making sure it reflects changes in accounting procedures and government regulations, including 401(k), TEFRA, and FAS52. (That

eliminates a lot of tedious work you normally have to do.)



Save this box. It can help you make an intelligent software decision.

1. Can you offer us a complete range of software systems designed to work together?

Or will we have to piece together a patch-work of systems?

2. Are your systems just record keepers, or can they really help us make decisions?

Can we pull together information from any of our integrated systems? In exactly the form we want it?

3. Can you provide business software for both mainframe and microcomputers?

Do you develop this software yourself or do you simply market it for another company?

4. Are your systems truly online so all of our information is current?

How many of your systems are online? How secure are they?

5. Will my company have to be the one that discovers the bugs in your brand new system?

Just how long have your systems actually been used, and how have they been tested?

© Management Science America, 3445 Peachtree Road, N.E., Atlanta, Georgia 30326

6. Will you update your systems as technology advances and regulations change?

What are some of your most recent updates? Will you keep us current on regulatory changes?

7. Do your systems really do everything you say they will?

Or will we have to change them or add to them to get the features we want?

8. How long have you been in business?

What are your revenues? What is your growth record? Where will your company be five years from now?

9. How many systems has your company installed?

How many of these were installed in the past six months? How many of your earlier customers are still using—and liking—your systems?

10. Do your financial systems handle unlimited foreign currencies?

Do your financial systems use a common set of currency exchange rates?

11. Can you link our executives' computers directly to the mainframe—so they can get their own information?

Is that software available right now?

12. How will you make sure our own people thoroughly understand your system?

Do you have educational centers near us, or will we have to travel all the way across the country to find one? Will you be there to help during installation and after?

13. How many of your people specialize in software for my industry?

How many accountants work for you? Human resource specialists? Manufacturing experts?

14. Do your systems have built-in features that make them easier to use?

What happens if someone needs help figuring out a feature? Do you have online documentation that's easy to understand?

15. As my business changes will your system be flexible enough to change with it?

Or will we have to pay a lot to revamp it? Or even regenerate it?

35,000 days of training

At MSA, we make sure your people have a firm grasp of our systems. Last year alone, we conducted more than 35,000 student days of customer training for over 1,800 companies. At education centers all over the world, as well as at our headquarters.

From training sessions to cassettes to complete, easy-to-understand documentation, MSA provides the most extensive Customer Education Programs in the industry.

And MSA systems are just as friendly as our people. Our online HELP feature actually guides users through our systems, and EASY-SCREEN™ lets them design their own screens without creating data processing nightmares.

If there's ever a question or problem with our systems, MSA customers are always close to service.

Our Account Managers are knowledgeable, responsive, and backed by a complete team of industry specialists.

The heart of our integrated systems

It's MSA's General Ledger System. Combined with Accounts Payable/Purchase Order Control and our other systems, it gives your company complete control over your financial information.

Over 800 data process-

ing specialists, accountants, and financial experts work together to make MSA's financial systems the most advanced and most highly integrated in the industry.

MSA has the answers

Whatever your size—whatever your business—MSA has a total software solution.

We'll provide the highest quality integrated online software.

We'll tie your business and manufacturing software systems together, using our exclusive Extended Closed Loop™ manufacturing system.

We'll provide business software for your microcomputers, through our Peachtree Software Company.

We'll even link your microcomputers to your company's mainframe—with

MSA ready-to-install application software

1. General Ledger
2. Accounts Payable/Purchase Order Control
3. Budgetary Control/Encumbrance
4. Fixed Assets Accounting
5. Capital Expenditure Tracking
6. Forecasting & Modeling
7. Accounts Receivable
8. Order Processing
9. Foreign Exchange
10. Inventory & Purchasing
11. Payroll
12. Personnel Management & Reporting
13. ALLTAX™ Taxing System
14. Manufacturing Control System (MRP II)
15. Executive Peachpak™ II
16. Peachtree Software™ business systems for microcomputers
17. Peachtree Software™ office productivity systems for microcomputers

ALLTAX, EASY-SCREEN, Executive Peachpak II, Peachtree Software, and Extended Closed Loop are trademarks of Management Science America, Inc.

MSA's Executive Peachpak™ application software. A revolutionary concept that lets executives get the mainframe information they need through their personal computers.

Talk to us

We'd like to send you more information on how MSA can help you plan for software. And on individual systems. Contact Robert Carpenter at (404) 239-2000.

FREE personal computer...



...with your qualifying purchase of MSA mainframe software and Executive Peachpak II™, the hot new technology that links your personal computers to the mainframe. So executives can get their own information without waiting for print-outs from data processing.

You'll be getting the highest quality mainframe software available. Executive Peachpak II, the advanced micro software that links PCs to the mainframe. And a free personal computer as a bonus.

This special offer is available for a limited time only. For details on how to get your free personal computer, contact Robert Carpenter today at (404) 239-2000. Or write "Free Computer Offer," Management Science America, Inc., 3445 Peachtree Road, N.E., Atlanta, Georgia 30326.

This offer expires December 31, 1983, so act today.

MSA

The Software Company